BOAO FORUM FOR ASIA

REPORT ON THE FIRST CONFERENCE OF THE GLOBAL HEALTH FORUM OF BOAO FORUM FOR ASIA

BOAO FORUM FOR ASIA GHF
GLOBAL HEALTH FORUM OF BOAO FORUM FOR ASIA

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Health Beyond Health

—— In the Year of Sustainable Development 2030

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Preface

Jointly initiated by related Asian countries, BFA is a high-level dialogue platform for political, business and academic leaders to discuss key Asian and global issues. In recent years, BFA has been adhering to its status as an economic forum, while keeping abreast of the times to expand into focal areas including science, technology & innovation, health, education, culture and media in response to the new economy and international cutting-edge topics.

The Global Health Forum is a comprehensive platform initiated in 2018 in global health for high-level dialogue and cooperation among the political, business and academic communities. BFA successfully held the first conference of the GHF in Qingdao between June 10 and 12, 2019, attracting more than 2,600 participants from 55 countries and regions. Firstly, themed on "Health Beyond Health – In the Year of Sustainable Development 2030", the forum was well received. Secondly, global professionals in health field led discussions on cutting-edge and deeply concerned health issues in "Universal Health Coverage", "Innovation for Health", and "Health in All Policies", through which consensus and plans for future generations were built. The first conference of the Global Health Forum thus has established a clear concept —"Health Beyond Health" in Asia and beyond, and built a new model of reaching the goal of "Health for All".

The report on the first conference of the Global Health Forum is released by Boao Forum for Asia to share with stakeholders the insights and consensus of participants attending GHF, in an effort to further promote exchange and cooperation in global health, innovation and development in health undertakings and industries.

Since the outbreak of COVID-19 pandemic, Chinese government has been taking decisive, forceful measures to contain the spread of the virus, which is highly recognized by the World Health Organization (WHO). At present, the pandemic is spreading around the world. The imperative to strengthen confidence, act in unity and make a collective response should be more highlighted. GHF stands firmly with the international community to tackle the pandemic. Traditional medicine, Online healthcare and Youth health—the three focused areas of research selected by the report—which merit in-depth exploration, have come to the fore during the fight against the pandemic. The Organizing Committee of GHF is also closely monitoring the evolvement of the pandemic, while maintaining close communication with global experts. Based on their advice, GHF has decided to add topics and sessions regarding "responses to major public health emergencies" to the second conference of GHF.

GHF will continue to share with the world its discussions and intellectual products in a timely manner and work towards the health of humanity as a platform for international cooperation.

Chapter 1
The First Conference

WHO defines Health as "Health is a state of complete physical, mental andsocial well-being and not merely the absence of disease or infirmity". The health of individuals and populations has many determinants - social, economic, political, commercial , biological and ecological - and showcases the relationship between people and the ecosystems upon which they depend. Health contributes to and benifits from progress in other sectors and ensures the peace, prosperity and well-being of all people.

National health is an important symbol of a country or region's sustainable development capacity, also an essential issue with a high degree of consensus in the international community, and has become a big part of global governance. Being healthy and living a long-lived life is the desire of all. We all hanker for access to adequate, efficient and safe health services throughout our lives. Therefore, as early as 40 years ago, the "Almaty Declaration" set out the ideal goal of "Health for All". For 40 years, people worldwide have been thriving for this ambitious and visionary goal. In September 2015, the United Nations adopted "The 2030 Agenda for Sustainable Development", and listed "Ensure healthy lives and promote well-being for all at all ages" as one of its significant goals. In October 2018, The Global Conference on Primary Health Care adopted the "Declaration of Astana", calling on "Governments and societies that prioritize, promote and protect people's health and well-being, at both population and individual levels, through strong health systems". Stakeholders globally are accelerating to promote Universal Health Coverage and the full realization of "The 2030 Agenda for Sustainable Development".

At the same time, the progress made in health between countries and within countries is tremendously different, and health issues remain a global challenge. Statistically[1], at least half of the world's population still do not have full coverage of essential health services. About 100 million people are still being pushed into extreme poverty (defined as living on 1.90 USD or less a day) because they have to pay for health care. Over 930 million

Figure 1-1 Human's continuous pursuit of health goals and actions

people (around 12% of the world's population) spend at least 10% of their household budgets to pay for health care. It is thus clear that the problems of inadequate basic health care, insufficient funding and imbalanced development in the global health field still exist, and there is still a long way to go to achieve the goal of "Health for All".

In this context, Boao Forum for Asia decided to give full play to its unique features and advantages and set up the Global Health Forum. The GHF serves as a comprehensive platform for high-level dialogue and practical cooperation among the political, business and academic communities to boost new international cooperation in the field of health, to share new dividends in technological changes, to drive new developments in global health, and ultimately to support the full realization of "Health for All" in the international community.

1.1 Overview of the First Conference

1.1.1 General introduction to the First Conference

The first conference of the Global Health Forum of Boao Forum for Asia jointly hosted by Boao Forum for Asia and the People's Government of Shandong Province, was held between June 10 and 12, 2019 at the Qingdao Cosmopolitan Exposition International Conference Centre in Qingdao, Shandong Province, on the theme of "Health Beyond Health – In the Year of Sustainable Development 2030, with three sub-themes, 'Universal Health Coverage', 'Innovation for Health' and 'Health in All Policies'. The Forum brought together representatives from international

1： [Please refer to: https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc).]

organizations, governments, non-governmental organizations, academia, industries, media and civil society from 55 countries and regions. Figure 1-2 and Figure 1-3 show the representatives of all parties participating in related activities in the first conference.

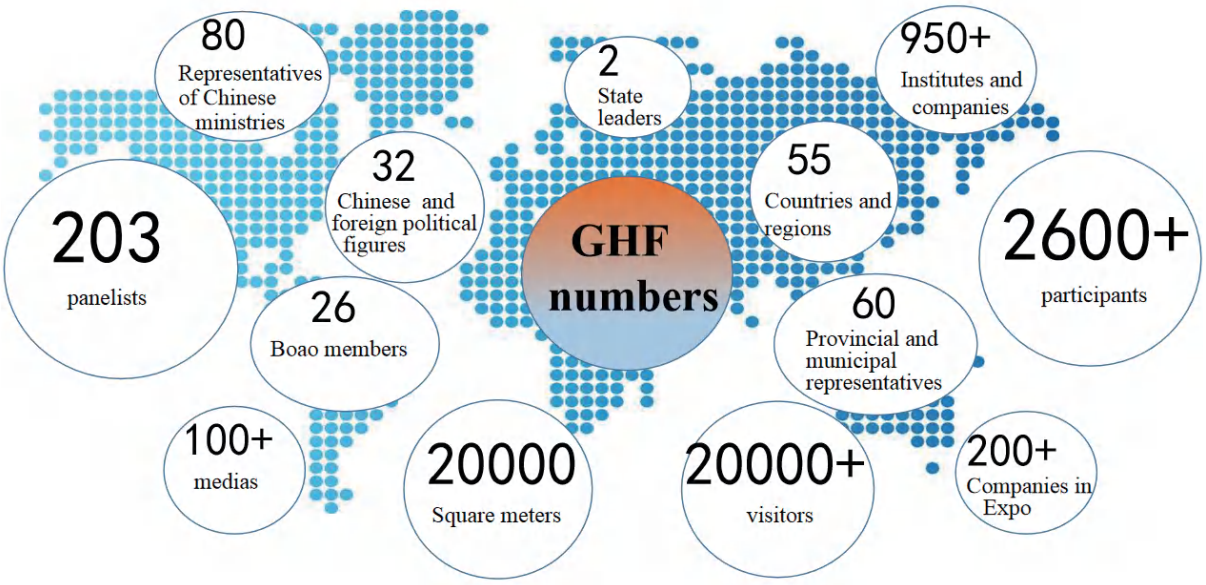


Figure 1-2 Participation of all parties in the first conference

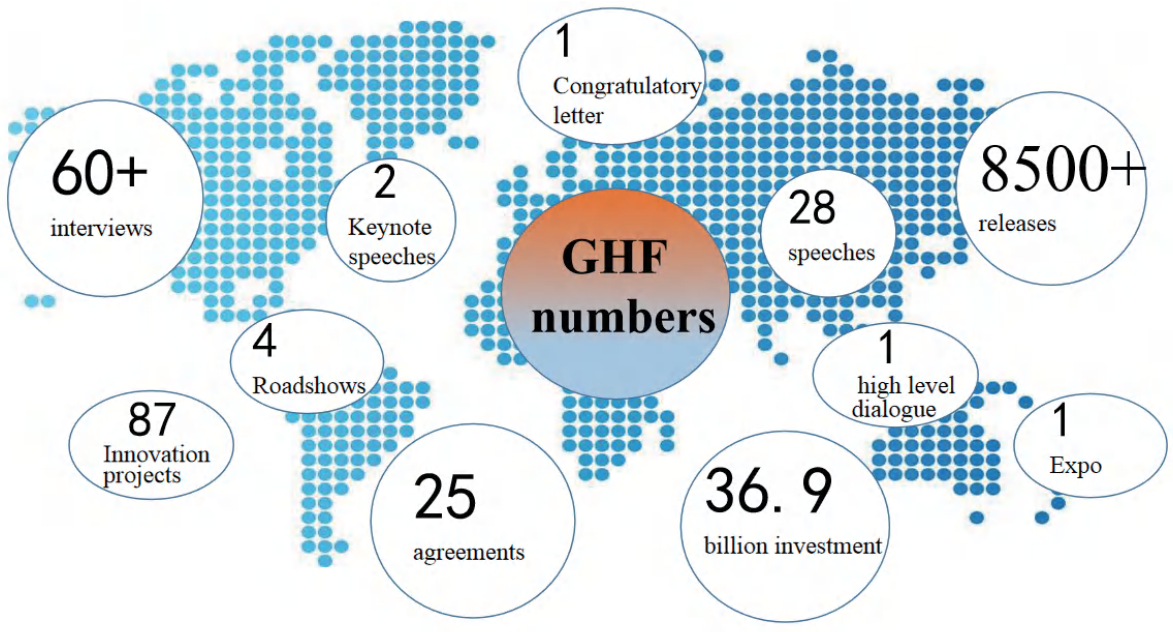


Figure 1-3 Activities of the first conference

The first conference was supported and actively participated by governments and international organizations, as shown in Table 1-1.

Table 1-1 Participation of all parties in the first conference

Support Units	Governments	International Organizations
National Health Commission	Former Prime Minister of Japan	World Health Organization
State-owned Assets Supervision and Administration Commission of the State Council	Former Prime Minister of New Zealand	World Intellectual Property Organization
State Administration for Market Regulation	Former Prime Minister of Korea	The Global Alliance for Vaccines and Immunization
National Healthcare Security Administration	Ministry of Health of Cambodia	International Telecommunication Union
Chinese Academy of Engineering	Ministry of Health of Singapore	International Federation of Red Cross and Red Crescent Societies
National Administration of Traditional Chinese Medicine	Ministry of Health of UN	International Committee of the Red Cross
National Medical Products Administration	Health Policy Development and Planning Bureau of Philippines	The Global Fund to Fight AIDS, Tuberculosis and Malaria
China Disabled Persons' Federation	The Food and Health Bureau of HKSAR	The UN Resident Coordinator's Office
Red Cross Society of China	Provinces and cities in China	UNHCR Office in China
		Bill & Melinda Gates Foundation
		United Nations Population Fund in China

1.1.2 Opening Ceremony and Plenary

The Opening Ceremony and Plenary attended by about 1500 participants (among them about 400 important participants) were central to the Forum, commencing with a welcome speech from Li Baodong, Secretary General of Boao Forum for Asia, followed by a congratulatory letter from Chinese President Xi Jinping, expounding the fundamental role of Universal Health Coverage in global health and promoting international cooperation in health field. The message was read by Vice-Premier, Madam Sun Chunlan, who also addressed the Forum and called for a more fair and reasonable global health governance platform to promote health exchanges and cooperations. These were followed by messages from Dr. Margaret Chan, President of the Global Health Forum of Boao Forum for Asia, Mr. Liu Jiayi, Party Secretary of the CPC Shandong Provincial Committee, Mr. Yasuo Fukuda, former Prime Minister of Japan and Chairman of Council of Advisors of Boao Forum for Asia, Dr. Tedros Adhanom Ghebreyesus (video), Director-General of the World Health Organization and Elhadj As Sy, Secretary General of the International Federation of Red Cross and Red Crescent Societies.

> "Health for All" is the common aspiration of humanity and a key part of the building of a community of a shared future for mankind, and advancing the cause of global health is also important in implementing the United Nations' 2030 Agenda for Sustainable Development. Boao Forum for Asia is an important effort in promoting the common development and people's well-being in Asia and around the world, to which the Forum has been committed. I hope that the forum would help pool strength from all sides, build consensus, enhance exchanges, advance the global health cause and the health sector, and promote international health cooperation, in order to contribute to promoting the health of humanity.
>
> —Congratulatory letter from President Xi Jinping

Boao Forum for Asia is a comprehensive forum with both Asian characteristics and global influence. The establishment of the Global Health Forum has provided an important platform for global health cooperation. It is of great significance for this conference to start discussions and exchanges on "Health for All". Health is the eternal pursuit of human beings, and health promotion is the common responsibility of the international community. I believe that through this conference, everyone's exchange of ideas and promotion of consensus will definitely help promote Universal Health Coverage and improve the health and well-being of people in all countries.

—Keynote speech by Vice-Premier Sun Chunlan

The high-quality economic and social development has enabled people to pursue better health, safety and self- development. A new round of scientific and technological revolution will further improve human health, which together with increased life expectancy, will in turn boost social production. The health sector will undoubtedly lead to new chains of values, industries and services, as well as innovative ideas, technologies and management methodology. Health is productivity in an era of high-quality development.

—Li Baodong, Secretary General of Boao Forum for Asia

For those who working on global health, we need new business modes, new medical services and new innovations in science and technology which can bring us more potential and higher ability to deal with the health threats of all people facing. It is essential to emphasize "multi-sectoral collaboration" in terms of disease prevention, healthy life style, inclusiveness, innovation and "Health in All Policies". Only prevention can make health affordable and sustainable.

—Margaret Chan, President of Global Health Forum of Boao Forum for Asia

Shandong enjoys a good foundation and unique advantages in the development of healthcare industry. We hope that we can establish exchanges and cooperative relationship with everyone through the Global Health Forum to jointly address the challenges in the health field ,to promote the transformation of scientific and technological achievements in connection with health , to drive the development of health industry and realize the goal of "Health for All".

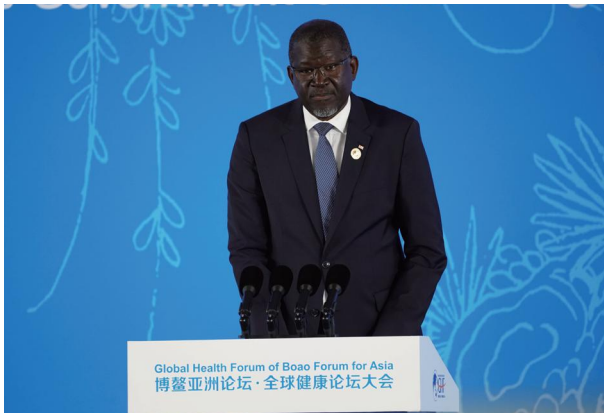
—Jiayi Liu, Secretary of CPC Shandong Provincial Committee

The concept of medical care will change greatly, in particular the development of new technologies, such as AI. New technologies will also enable the elderly and the disabled to better realize their potentials. In order to make more people enjoy the achievements of scientific and technological innovation, a good social system is needed to make the realization possible. Universal Health coverage is one of the important solutions.

—Yasuo Fukuda, Former Japanese Prime Minister

WHO is calling on all countries to commit to Universal Health Coverage, based on strong Primary Health Care. We also call on countries to adopt "Health in all Policies" approach to address the root causes of ill health in the commercial, economic, environmental and social conditions in which people live. And we call on all countries to harness the power of innovation.

—Tedros Adhanom Ghebreyesus, Director-General of WHO (Video Speech)



Improving human health is important because health is closely related to our lives. Health is about all human beings and helps to achieve a balance between man and the environment. Medical workers around the world are dedicated to promoting Universal Health Coverage and improving human health and well-being.

—As Sy, Secretary General of IFRC

The Plenary was chaired by Professor Gabriel Leung, Dean of the Li Ka Shing Faculty of Medicine at the University of Hong Kong, and commenced with a keynote speech entitled "From Healthcare Reform to Humanitarian Agenda in China" by Professor Chen Zhu, Vice-Chairman of the Standing Committee of the National People's Congress, and President of the Red Cross Society of China. His presentation described the remarkable progress achieved through health reforms in China over the last decade, and the plan for the future – "Healthy China 2030" . Following his presentation, a series of speeches were made by political leaders (former Prime Ministers of New Zealand and the Republic of Korea), Ministers of Health (Singapore and Cambodia), representatives of international organizations (Deputy Director-General of WHO, representative of the ITU and the CEO of GAVI), senior government officials (heads of several ministries in China and the Chief Medical Officer of England), representatives of philanthropic organizations (Bill & Melinda Gates Foundation), and senior leaders from several health industries (chair of Haier group, COO of Inner Mongolia Yili Industrial Group, and Global President for Emerging Markets in Pfizer).

Health and humanity are language of peace. To form joint international emergency response teams (ERTs) for disaster response in countries/regions with conflict; To initiate a network of One Health to conduct education/training for professionals all over the world and support research activities for global health, animal health, safety and security of environment and food; To support high level dialogues between South and North for the prevention and control of both emerging infectious diseases and NCDs as well as communication between experts.

—Chen Zhu, Vice-Chairman of the Standing Committee of the National People's Congress

Through the rational use of public resources and more advanced technologies, relevant institutions in the field of healthcare should work together to provide better services for people in all countries.

—Dame Jenny Shipley, former Prime Minister of New Zealand

Practices in all countries have proven that treatment is not the only way to improve national health, and prevention is the most economical and effective health strategy.

—Zhang Mao, former Director of the State Administration of Market Supervision and Administration of China

Over the past decades, climate change has changed the way that infectious diseases are transmitted and had a huge impact on health.

—Han Seung-soo, former Prime Minister of South Korea

The construction of the free trade port that Hainan is promoting will inject more powerful impetus into the development of health industries, and bring more business opportunities for global enterprises to share China' development in health sector.

—Shen Xiaoming, Governor of Hainan Province, China

Technological innovation has become an important factor in promoting universal health. We need to establish a system to continuously promote the development of health undertakings and the continuous flow of funds into the health industry.

—Mam Bunheng, Minister of Health of Cambodia

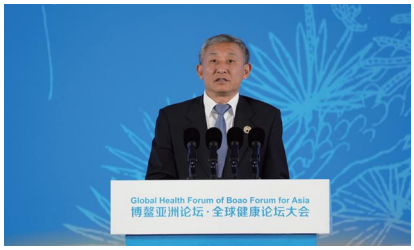
To ensure the long-term sustainability of the medical system, Singapore is undergoing three major transformations. First is to go beyond health and make upstream investments; second is to strengthen team-based chronic disease management; third is to pay more attention to the value of the medical system.

—Gan Kim Yong, Minister of Health of Singapore

Achieving Universal Health Coverage and innovations that promote health and well-being in all policies creates opportunities to improve health outcomes, quality of life, and the health of entire communities and countries.

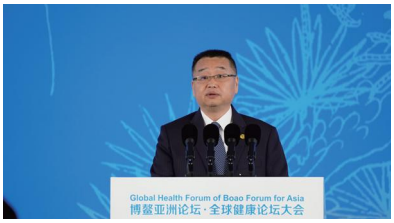
—Seth Berkeley, CEO of the Global Alliance for Vaccines and Immunization

Zsuzsana Jakab



Peng Huagang

Sally Davis



Hu Jinglin

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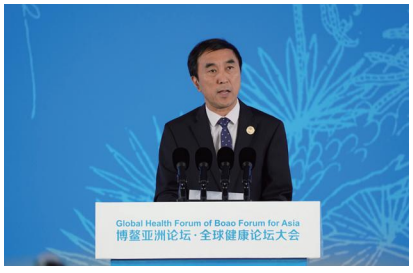

Wang Haijing

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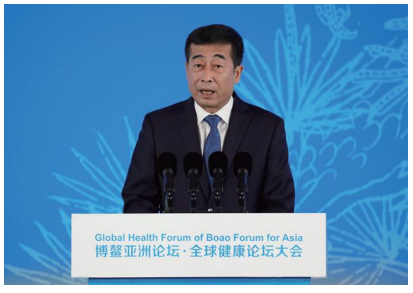

Zhang Jianqiu

Susan Silberman

I believe that the government, industry and scientific research institutions will join hands and work together for better health.

—Zsuzsana Jakab

We are willing to conduct extensive cooperation and exchanges with institutions and enterprises engaged in the health industry at home and abroad, give full play to their respective comparative advantages, jointly promote the health and well-being of people around the world, and provide health guarantees to build community of common destiny for all mankind.

—Peng Huagang

Health is the primary asset of every nation, because healthy people are the core of the economy, and health is also the source of personal happiness.

—Sally Davis

Universal medical insurance is a basic institutional guarantee for the health of all citizens, and it is also the foundation of a basic medical and heathcare system with Chinese characteristics.

—Hu Jinglin

Innovation is essential for health improvement. We depend on innovation to develop new therapies and cures. But innovation requires investment and incentives.

—Wang Binying

The 21st century is the century of life medicine. After 2030, medical science and technology will become the largest technology. Medical technology is also an important force to promote industrial progress and high-quality development of the national economy.

—Liu Depei

Our work is grounded in two principles: all lives have equal value; everyone should have the opportunity to live a happy and productive life. We must continue to work towards our goals, continuously increase investment and innovation, and strengthen strategic cooperation.

—Chris Elias

Traditional Chinese medicine embodies profound philosophical wisdom, the concept of health literacy of Chinese nation, and practical experience in preventing and treating diseases. It is both traditional and modern. It belongs to nation also belongs to the whole world.

—Yu Wenming

To ensure public health, we must adhere to the bottom line of drug safety and deepen international cooperation, ensure public safety, actively promote innovation-driven development, and improve regulatory capabilities.

—Jiao Hong

Promoting the development of global health, rehabilitation should be of uppermost priority, and rehabilitation is the hope of health.

—Zhang Haidi

The Red Cross Society of China has always carried forward the spirit of humanity, fraternity and dedication of the Red Cross, protecting human life and health, safeguarding human dignity, and promoting the cause of peace and progress.

—Wang Haijing

The conference held in Qingdao will undoubtedly win the global influence and opportunities for the development of Qingdao's healthcare industry.

—Wang Qingxian

International brand equity database BrandZ rated Haier as the only ecological brand of the Internet of Things among the world's brands.

—Zhang Ruimin

As a healthy food company, it is the mission of Yili Group to provide consumers with healthy products and also our responsibility to contribute to the human health.

—Zhang Jianqiu

China plays a very important role in global strategy to drive innovation that will bring breakthroughs to change patients' lives.

— Susan Silberman

1.1.3 Dialogue between Ministers and Enterprisers

A roundtable of Ministers and Enterprisers presided over by Dr. Anarfi Asamoa-Baah, former Deputy Director-General of the World Health Organization brought together health ministers and senior officials from several Asian countries, representatives from international organizations and NGOs,together with representatives of health enterprises all over the world. The focus of their discussion was on collaboration to increase access to medical technologies and pharmaceuticals for non-communicable diseases, affirming the fundamental role of partnership in achieving the goal of SDGs.They emphasized the importance of building trust between the public and private sectors based on respect, accountability and a willingness to listen with a shared commitment to action and dialogue, which is vital to realize the goal of "Health for All".

1.1.4 Three Sub-themes, 28 sessions

28 sessions explored three sub-themes, "Universal Health Coverage", "Innovation for Health" and "Health

in All Policies". In more detail, 8 on topics related to "Universal Health Coverage", 13 on "Innovation for Health", and 7 on "Health in All Policies". All sessions are interactive discussions, with 177 speakers under the organization of 26 moderators who spoke based on their experience and perspectives and engaged in dialogues with the audiences. Each session is farsighted, exploring various aspects covered under this topic, sharing a lot of practicable and innovative ideas, which will help to promote the realization of human health well-being, stability and equality. Specifically, "Universal Health Coverage" stream covered an equally diverse series of topics, exploring international cooperation in global health, the needs of ageing population, the contribution of traditional medicine, capacity building for emergencies and epidemics, the need for sustainable financing for Universal Health Coverage, and the prevention and management of non-communicable diseases in Primary Health Care.The health issues of women and the elderly people were at the forefront of the Forum.Women health forum advocates women from government, international organization, academia and industry to take leadership and attach importance to women in health field so that they can all benefit from it, highlighting the value of the 'gender dividend' in engaging women. The aging forum calls on the international community to give full consideration to the issue of aging so that the elderly can maintain physical and mental health, do valuable things, and lead a worthy life.

"Innovation for Health" stream covered a wide range of topics, several of which described and discussed opportunities of new technologies that utilize 'big data', artificial intelligence, robotics and internet, etc. Other sessions reviewed exciting new developments in research on the microbiome, in malaria prevention and control, and the reinvented toilet. Others discussed steps for accelerating the development and application of innovative technologies in the field of life sciences, the role of industrialization and the global market, addressing market failure,ensuring equitable acess to health services, and managing risks of misuse of technologies. Several sessions covered discussions on enhancing collaboration in innovation and delivery, with presentations on medical innovation projects in China, South-South Cooperation, collaboration between China and the European Union.

Several sessions were dedicated to dialogue on "Health in All Policies", which focus on topics such as planetary health, urban development, talent building in health field, risk factors for chronic non-communicable diseases, antimicrobial resistance, and rehabilitation of the disabled. The Youth Health Forum puts its perspective on the youth group who are supposed to be the healthiest, and calls on young people to take action on health issues, actively engage in scientific research related to health, and use their down-to-earth efforts to give play to their leadership capabilities.

1.1.5 Other activities

In parallel with the Forum, the Global Health Expo attracted over 20,000 visitors to the stands of over 200 exhibitors covering an area of 20,000 square meters. Visitors were able to view and experience the products and services of a diverse range of companies, institutions engaged in various fields, including cutting-edge medicine, medical technologies, biotechnologies, intelligent healthcare, online healthcare, AI, social security and public services.

In addition, 4 innovation roadshows showcased 87 projects from domestic and international companies, including new health technologies, products and services , providing an opportunity for participants to learn more of recent developments that have the potential to make a significant contribution to health.

The conference also hosted a number of activities, including a welcome dinner, a WHO luncheon, a memorandum of understanding signing ceremony, a Qingdao signing meeting, and a traditional Chinese medicine experience project. During the conference, more than 250 journalists from more than 100 media attended the conference. Xinhua News Agency, CCTV, People's Daily and other mainstream Chinese media, as well as the Financial Times of UK, The Wall Street Journal of US and other foreign mainstream media have reported on the conference. According to incomplete statistics, the media exposures at the conference reached 6.67 million.

1.2 Outcomes and Future

1.2.1 Outcomes

In conclusion, several common threads emerged from various meetings and events, which can be summarized as follows. The world is healthier, more prosperous and more peaceful than at any other time in recorded history. Yet paradoxically, the environment in which we live is under threat from climate change, environmental degradation, pollution and overconsumption of finite resources, threatening to undermine the substantial progress in well-being that has been made in recent decades. Yet the future is bright. The development and application of new technologies and increasing international exchanges and cooperation in health field, providing unprecedented opportunities to significantly accelerate improvement in health outcomes.

Firstly, Universal Health Coverage based on Primary Health Care means moving beyond hospitals to the community, beyond quality to value, and beyond health care to comprehensive health management. There is clear evidence that Primary Health Care is extremely cost-effective, so increasing medical spending on Primary Health Care can help improve the efficiency of Universal Health Coverage.

Secondly, the distinction between health and disease is blurring with rapid developments of these new technologies, such as Artificial Intelligence, block chain, the Internet of Things, robotics, and the roll

out of 5G networks that provide opportunities for early detection of risk factors and other determinants of disease. Interventions can therefore be implemented from population screening to public health predictions. With the rapid development of new technologies, assessment and supervision mechanisms must be strengthened so that new technologies can be introduced in the health field fairly, reasonably, and sustainably.

Thirdly, improving the health of the population and promoting health equity are cross-sectoral public health policies that require the participation of all stakeholders in the health field and the formation of synergies through partnerships. Integrating health into all policies is vital to encourage international exchanges and cooperation in the health field and is an important way to achieve the Sustainable Development Goals of UN. True partnership is built and sustained through respect, dialogue, accountability and a complete mechanism.

1.2.2 Future

The success of the first conference has clearly demonstrated the value and importance of continuing this forum. Having expressed appreciation for the first conference, participants enthusiastically welcomed the announcement that a second conference will be held in October 2020. While appreciating the steps taken to establish a dialogue between industry and the public sector, participants in the roundtable called for further dialogue in the next conference and proposed that additional mechanisms be developed.

The first conference has established a new and effective means of accelerating 'Health Beyond Health' in Asia and beyond. Several aspects of the conference made this a unique and unprecedented event, including the scale of the conference, the level of the participants and the diversity of organizational structure, its focus on human destiny and the commitment to sustainable development. These are all essential properties of the first conference of the GHF, and will be the key to the sustainability of the GHF.

Chapter 2
Universal Health Coverage

2.1 Overview

Universal Health Coverage (UHC) means that all individuals and communities receive the health services they need without suffering financial hardship. It includes the full spectrum of essential, quality health services, from health promotion to prevention, treatment, rehabilitation, and palliative care[2] .

UHC is a concept that was first advanced by the WHO at the 58th World Health Assembly in 2005[3], which proposed to establish a more equitable, efficient health-financing system to promote UHC. The 3rd of the 17 Sustainable Development Goals (SDGs) set by the United Nations in 2015 is to "ensure healthy lives and promote well-being for all at all ages". UHC is indeed considered one of the key components of the SDGs[4].In 2017, the WHO developed UHC measurement indicators within the framework of SDGs and found that at least half of the world population are not covered by primary healthcare services (see Table 2-1 below).

Table 2-1 WHO UHC service coverage index in 2015

WHO Regions	UHC service coverage index
World	64
African Region	44
Region of the Americas	78
South-East Asia Region	55
European Region	73
Eastern Mediterranean Region	53
West Pacific Region	75

2 : [https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc).]

3 : [Sun Lei and Zhang Chaoyang, Connotation and Measurement of Universal Health Coverage, Chinese Journal of Health Policy, 2014; 7(1):19-22]

4 : [The Lancet, Universal health coverage post-2015: putting people first. Lancet 384:2083, 2014.]

This table shows that there are still many challenges on the journey towards UHC (see details in the tablebelow)[5].Therefore, it remains a critical topic to explore how to overcome these challenges in order to fulfill conditions needed by UHC and translate research results into actions and policies.

Table 2-2 challenges and requirements of UHC

Challenges	Requirements
1.Fully implement the UHC concept of putting people first	Civil society should be represented in the leadership of UHC-related organizations. This means that citizens should be given greater roles in setting UHC priorities, targets and long-term indicators.
2. Strengthen the health system	
- Steer the healthcare system towards UHC	A sustainable health system is needed, whose performance in UHC should be measured on two indicators: comprehensive health service coverage (prevention and treatment) and financial risk protection. The health system should be reformed based on lessons learnt from the successful implementation of UHC programs.
- Develop a patient-focused health system	The health system needs to support acute disease treatment and chronic disease management, while connecting community-based care (like the offices of community healthcare workers) with insurance and health-financing systems.
3. Ensure affordable healthcare	
- Adjust the health-financing system to improve financial risk protection and reform the health system to ensure its smooth functioning	Develop and monitor health-financing policy and strategy to raise enough funds for health; reduce financial barriers, while spreading risks among the population (through prepayment and social pooling) and efficiently utilizing the existing resources.
4. Improve the quality of service	
- Unsatisfactory quality of service	Develop health service infrastructure and match healthcare manpower with healthcare needs.
- Provide primary health-care and ensure that priority health issues receive compre-hensive care	Develop an efficient referral system to provide holistic management and care; provide enough funding for prevention and health promotion as well as enough quality basic drugs and techniques for diagnosis and treatment; adopt evidence-based decision making; and bring healthcare workers closer to patients they serve.
- Better and more complete information on drug use	Develop an information system that can track the use, expense and quality of drugs; and regularly monitor the indicators such as drug supply, accessibility, affordability and use.
5. Capacity building	
- Mobilize human resources for UHC	Build the capacity of public health departments to enable primary healthcare
6. Emphasize the societal factors in health	
- Health inequality	Take targeted actions to address societal factors (including social and legal protection measures) to achieve equal access to healthcare

2.2 Session Highlights

2.2.1 Health Forum for Women

Gender equality is not only a fundamental human right, but also a necessary foundation for a peaceful, prosperous and sustainable world. Gender equality is also established by the UN as one of the Sustainable Development Goals (SDG5). Ensuring healthy lives for all

5 : [The Lancet, Universal health coverage post-2015: putting people first. Lancet 384:2083, 2014.]

means ensuring healthy lives for all females. While the world has achieved progress towards gender equality and women's empowerment under the Millennium Development Goals, women and girls continue to suffer discrimination and violence in every part of the world[6].

On the afternoon of June 10, 2019, at the Health Forum for Women during the first conference of the GHF, Moderator Margaret Chan highlighted that women play an important role in the delivery of UHC, but they have not received the recognition they deserve for their work and are still treated unequally in the global health sector. How can we put the role of women in global health into perspective? What can we do to address inequality? Participants at this forum shared their answers as follows:

- **Understand the gender dividend of women and create a favorable environment for women's empowerment**

Decision and policy makers who see UHC as a political choice should first realize the gender dividend women can produce, a dividend that is significant on three dimensions—health, economics and social development. In health, 70% of healthcare workers are women, who contribute USD 3 trillion in global GDP. To achieve UHC, the world will have to double the number of healthcare personnel, of which women is an integral part. Economically, women are responsible for most of home care and housework, like taking care of elder family members and children, usually free of charge. If this part of work was also characterized as paid work and included into GDP, all countries would see their GDP expand by two or three percentage points. Moreover, women usually spend incomes they earn from work on families, for example, by raising the next generation. From the perspective of social development, this is a very important benign cycle. Measures should be taken to ensure the visibility of this gender dividend in society. Government agencies, especially those ministerial-level departments in education, labor and finance, must value the dividend, while emphasizing the representation of women in leadership.

Therefore, we should invest in women and girls' education and ensure that they will have a safe workplace. First, legislative and regulatory actions must be taken to achieve equal human rights for women. Amid a thinking revolution, we must remove structural obstacles and reform social norms to enable women to work and get paid as decently as men do. Second, effectively utilize new technologies to make work more convenient for women. Technological progress has made it possible to address uneven resource distribution, empowering women to live longer and healthier than ever before. The adoption of modern technologies in healthcare, particularly information and communications technologies, has strengthened women's empowerment by enabling them to create value more efficiently. Finally, we should promote cultural change to encourage women to speak up. Gender and culture are usually intertwined. Women should speak up to enlarge the role of gender diversity in decision-making. However, it is a herculean challenge to advance cultural change. Therefore, in-depth research is necessary to identify which measures can effectively support women's leadership and solid evidence must be found to support the findings of such research.

6 : [https://www.un.org/sustainabledevelopment/zh/gender-equality/.]

● Connect with women through communication

Promoting UHC among women is often confronted with challenges. On this front, religion can be a positive influence for women's health. At some healthcare institutions in Africa, for example, 28% to 30% of women give birth with the help of religious practitioners. Religion and women's health are not mutually exclusive. Although some conservative religions do sometimes obstruct the enactment of women-related health policies, studies also show that there is a positive correlation between religion and women's health, particularly women's reproductive health. It is therefore important to rethink the relationship between the two and is instrumental to engage religious professionals in policy-making.

Communication is also critical in promoting UHC. The advent of social media has created three major changes—First, the penetration rate of social media is very high. Without using this tool, organizations may find themselves ineffective in reaching its target audiences. This has completely changed the way media and public health organizations work. Second, there exists a large amount of unfiltered information on social media, which has reduced the accuracy of such information. Third, public trust in states, churches, academics and professionals has been declining and their professionalism is increasingly questioned. For example, behind the recent measles outbreak as a result of parents' refusal of vaccines, we can see that women are usually decision-makers regarding whether or not to vaccinate their children. Therefore, it is critical to maintain effective communication with women.

In this regard, participants shared three pieces of advice—First, social media is also a networking platform, where organizations need to learn how to communicate, fully, with their target audiences, listen to their needs and provide customized information. Second, they need to win the trust of target users, as trust can foster mutual understanding. Communication is not just about providing data and information. There should be a people dimension to it. Third, to address women's chronic lack of trust in healthcare workers, organizations may start their communication first in fields where public trust is stronger. Take vaccination as an example. With the help of midwives, communication, dialogue and publicity can be started nine months before vaccination to ensure that women's trust is indeed increased. In a word, they must listen and respond accordingly. Moreover, participants also suggest that local cultures should be respected when communicating with the public, without making any assumption in advance. Solutions should be identified through communication and dialogue based on local realities and culture.

● Encourage female participation in community work

Since community service is not one-way or oriented towards individuals, people, in order to make comprehensive decisions, should also be involved in the performance of community service, particularly women, whose perspectives are often very important. As a marginal group, some women have the best knowledge of local communities, who urgently need help and where to get help. They can not only set directions for community service, but can also volunteer their services. They can provide their leadership by personally taking part and do a good job in the planning and implementation of community work. For this purpose, a favorable environment is necessary. At the same time, when implementing a project, female participation as a principle must be upheld in every aspect of work.

The International Federation of Red Cross and Red Crescent Societies (IFRC) is committed to improving gender equality in every area (such as governance, management, employees and volunteers) and set an example in female participation. The Figure 2-1 below provides a snapshot of women at the IFRC in terms of their percentage among various roles.[7]

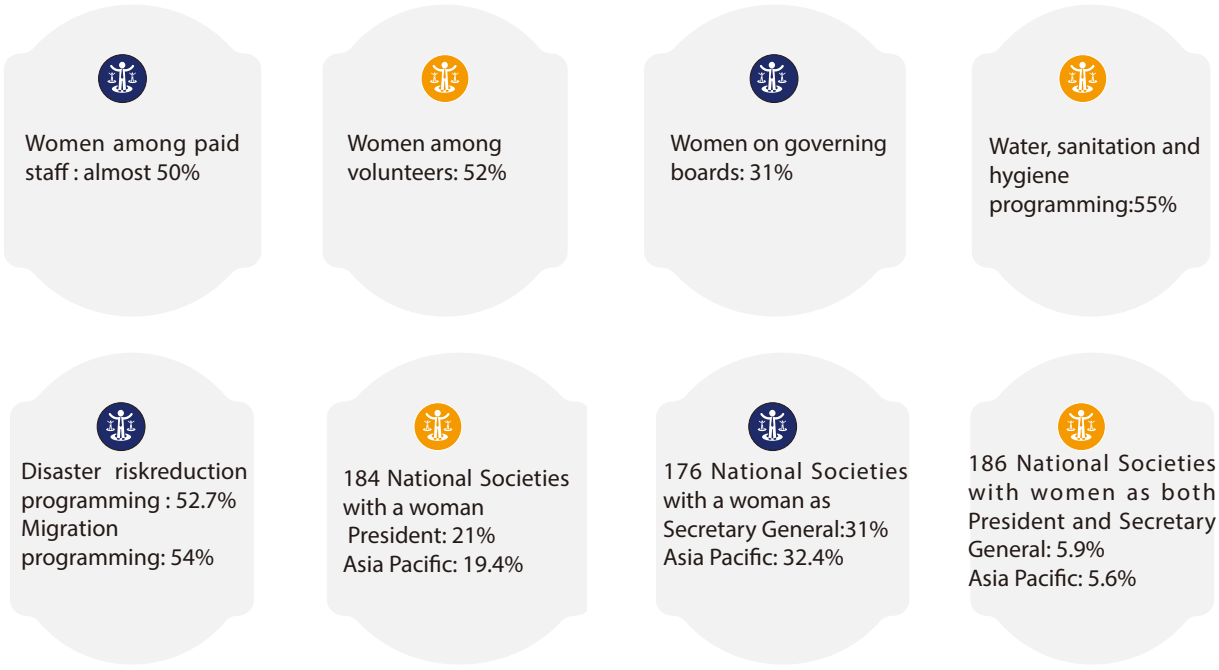

Figure 2-1 Percentage of women among roles at IFRC

2.2.2 Cooperation on the Global Public Health

On the afternoon of June 11, 2019, the session of Exploring Cooperation on the Global Public Health opened during the first conference of GHF. Opening speakers included Zhang Yang, Director-General of International Cooperation, the National Health Commission of China (NHC); Zhang Yong, Deputy Director-General of the Disease Control Bureau, NHC; Qin Chengyong, Deputy Director-General of the Health Commission of Shandong Province; and Luan Xin, Vice Mayor of Qingdao, Shandong Province. Gao Fu, Director-General of the Chinese Center for Disease Control and Prevention, gave a keynote speech. These speakers not only shared Chinese good practices in disease control and prevention and the combination of elderly care and medical services, but also highlighted the significance of public health and disease control and prevention in the advancement of the Belt and Road Initiative. They also explored how to expand exchange and cooperation among public health institutions in different countries and how to establish a security and prevention system for global public health in line with the requirements of International Health Regulations. Highlights of this session are summarized below:

- **Promote joint prevention and control, exchange and cooperation in the context of the Belt and Road Initiative**

The session proposed key words for global disease

7 : [Everyone Counts, May 2019 issue, IFRC]

prevention and control .They are mass prevention and control, joint prevention and control. In this globalized world, no country or territory is isolated. Instead of going it alone, countries need to support each other and join hands together to make this world a better place, regarding competition as a driving force and exchange and coordination as a connecting bridge. Under the framework of the Belt and Road Initiative, disease control and prevention requires the concerted efforts of all stakeholders, the formulation of holistic measures and the creation of a global platform for health governance.

As shown in figure 2-2, a principle of "4C"—collaboration, competition, communication and coordination—should be upheld in global cooperation in health. High-level dialogues can also be organized to facilitate coordination among different institutions. Global cooperation in health should be built on solid mutual trust, which can lower the cost and improve the efficiency of cooperation. To win trust, a country must present itself as a reliable and trustworthy partner; a country that displays low self-interest and high trustworthiness will find it easier to gain confidence.

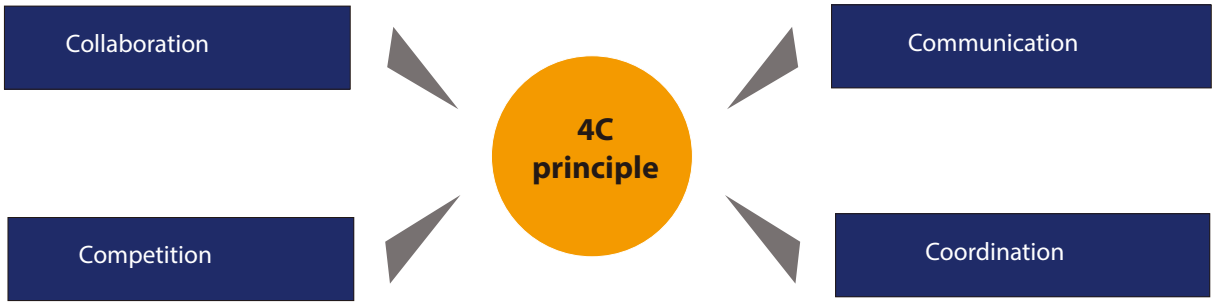

Figure 2-2 "4C" Principle of global cooperation in health

Despite the WHO's deep cooperation with countries and territories in the context of the Belt and Road Initiative, the WHO needs to further expand the depth and breadth of its cooperation with China in public health and create an efficient communication mechanism. At the same time, different comprehensive coordination teams should be formed to facilitate communication with different countries and personnel from different domains.

- **Add a sustainable dimension to public health security and UHC**

Disease knows no boundaries and priority should be given to public health. In a globalized world, when a contagious disease breaks out, its impact will spill over from its originating country to every part of the world. First, from the perspective of sustainable development, we must not underestimate the relationship between public health and national economic development. For example, the Western African Ebola virus epidemic, in 2014 profoundly disrupted Sierra Leone's economy; the H7N9 epidemic in 2013 also dealt a blow to China's economy. Second, preventive public health measures should be embedded in all international activities, supported by a global health cooperation network. Not a single country should be prioritized for its health. For example, half a century ago, AIDS remained endemic in Africa, but the mindset of a country giving priority to itself weakened the preventive actions. Today, AIDS has evolved into a global disease.

- **Summarize China's achievement in the capacity building of public health and share China's practices through partnerships**

The global health strategy of the Chinese Center for Disease Control and Prevention (CDC) points to its leadership as an institutional driver as well as to its capability of playing crucial roles in the development

of a global public health system. Today, China's CDC has already established an advanced, integrated system for disease control and monitoring, which is composed of four sub-systems and five platforms. This system can be scaled up on the platform of the Belt and Road Initiative to promote cross-regional cooperation in disease control and disaster relief and preparedness.

Participants pointed out that three steps may be followed to share China's good practices—The first step is to establish a partnership framework, which requires the involvement of governments, institutions and protocols, as well as the development of regional mechanisms. The second step is to share good practices with local residents, who in turn can make adjustment to suit local conditions. The third step is to share some necessary products with partner countries, such as diagnostic techniques and drugs. These three steps will be instrumental to China's sharing of its success stories.

2.2.3 Capacity Building for Emergencies, Emerging and Endemic Infections

On the morning of June 12, 2019, the session on Capacity Building for Emergencies, Emerging and Endemic Infections opened during the first conference of the Global Health Forum. Ailan Li, Regional Emergency Director, WHO Health Emergencies Program, highlighted the purpose of the session, which is to raise public awareness of health security risks and collectively explore how to build capabilities in responding to public health emergencies in line with core capacities required by the International Health Regulations. Around this theme, panelists shared their inspiring perspectives and insights.

- **Draw valuable experiences from past actions to constantly improve responses and tackle challenges from this changing world**

The World Health Organization is powerful in responding to emerging and endemic infections, which has established health security as one of its priorities for the next five years. Compared with 10 years ago, WHO member states have significantly improved their response capabilities. For example, it would take one month to detect an avian influenza virus back in 2006, but now it only takes six days. It is true that there will be inevitably inadequacies on the part of the WHO every time it responds to an emergency. Even today, such inadequacies still exist. However, it is based on such inadequacies and lessons we have learnt in the past that we have been constantly strengthening our response capabilities.

In this constantly changing world, the WHO's surveillance system monitors health emergencies worldwide around the clock, reporting an average of two emergencies every week over the past two decades. Compared with 20 years ago, we are now in a hugely different environment, as evident in the massive flows of people and goods. In China, such flows have increased 14-fold. At the same time, urbanization has made it more challenging to control and prevent infectious diseases. One typical example is that humans are increasingly exposed to animals during the urbanization process, which makes humans more vulnerable to infectious viruses originating in animals. Data show that of the more than 1,500 kinds of new pathogens that have been discovered since the 1970s, 70% trace their origins to animals. Moreover, human's contact with animals can also improve the resistance of pathogens to drugs, for example, to antibiotics.

The advent of social media has changed the way people access information, making it easier to spread rumors. Therefore, communication regarding future public health emergencies will face a more complicated situation and will be more demanding of the ability of communicators and policy makers, who will find

themselves faced with the concurrent risk of false information and rumors spreading at the same speed.

In response to these changes, WHO experts shared five recommendations to add flexibility and speed to responding to public health emergencies in order to strengthen communication and coordination in uncertain circumstances—First, "move forward" the response system to deal with the rapid spread of bacteria and viruses; second, improve decision-making abilities and develop a new risk evaluation framework; third, make policy-making more transparent to the public; fourth, strengthen the surveillance of contact between humans and animals to address drug resistance; and fifth, strengthen capabilities in border disease control and prevention for the sake of a country itself and its neighboring countries.

- **Increase investment in research, strengthen exchange, cooperation and capability development and make full use of opportunities from this changing world**

The past two decades witnessed all countries, including China, once fighting against very serious emerging diseases and unexpected public health incidents. Generally, all countries remain inadequately prepared. Therefore, all countries should expand investment in basic research, deepen public-private partnership and strengthen relevant capabilities in domains such as manufacturing, research and public health, so as to accelerate emergency response and expand preventive investment in emerging diseases and health emergencies.

Health is one of the most important components of programs carried out by the International Federation of Red Cross and Red Crescent Societies (IFRC). During the 2016-2017 period, health intervention measures by IFRC covered approximately 102 million people worldwide. [8]Among all health fields, the IFRC has long focused on epidemic and pandemic preparedness, response and management. Based on lessons learnt over the past, the IFRC believes that a pandemic starts and ends at the community level. As illustrated in figure 2-3, its experience in community work is epitomized in its principle of "TOP"—trust, ownership and partnership. To contain the spread of an infectious disease in a community, health workers must first focus on people and win their trust and then return ownership of health to individuals, so they can decide by themselves how to manage and solve their health issues. In this process, organizations should play guiding and instructive roles and finally form cross-sector and cross-disciplinary partnerships to implement measures at various levels.

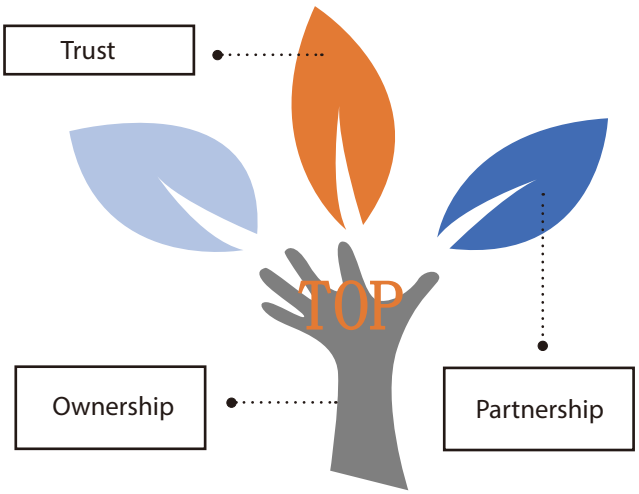

Figure 2-3 TOP Principle of IFRC's community work

Experts from the Swiss Agency for Development and Cooperation (SDC) said that the SDC has a very robust global health management program, which can help low- and middle-income countries assess response systems for public health emergencies and enable them to provide emergency response. Today, the Belt and Road Initiative has created the most salient opportunity to open doors for communication and cooperation regarding emergency response, thus improving capabilities in handling and responding to health issues, crises and emergencies in Belt and Road countries. The initiative can also help the SDC scale up

8 : [Everyone Counts Report 2019, IFRC]

its global health management program in along the route countries, deepen cooperation, promote dialogue and exchange and collectively shape new health agendas with other countries and territories.

2.2.4 Sustainable Financing, Medical Insurance System and Poverty Alleviation Approaches

Universal Health Coverage as a political choice still needs a certain degree of technical support to ensure that people will not be financially overstretched when seeking healthcare. The government needs to consider and choose how to utilize funds more efficiently and how to balance cost and quality of service. At the same time, the government should also recognize that government funding will not suffice to sustain a massive, sustainable health system and external financial support is required to achieve UHC. Moreover, countries vary by the stage of development and by the goal of the health system. Therefore, it necessitates a case-by-case analysis to resolve these issues.

On the morning of June 12, 2019, a session on Sustainable Financing, Medical Insurance System and Poverty Alleviation Approaches was held during the first conference of the Global Health Forum, where experts shared good practices in different countries regarding how to finance the health system for the purpose of sustainable development and UHC.

- **Increase the international exchange of good practices in health-financing and identify own paths in practice**

The Republic of Korea (ROK) modeled on Japan's UHC system to provide a medical insurance system that is based on family income, not on disease risk. It has also amended laws on medical insurance to ensure that all money is put into one pocket, with the support of a robust payment management tool. Furthermore, ROK has established an independent fund, whose system can analyze all data—including drug prices, technologies and medical expenses—in the medical insurance system, while offering predictions regarding future trends. However, the country is also struggling with issues such as expensive healthcare and non-reimbursable emergency and surgical expenses.

In Turkey, 85% of its population is covered by a UHC system, whose service package is rich enough to cover nearly all kinds of care, but medical expenses only account for less than 25% of Turkey's total health expense. Today, Turkey has put family doctors at the center of primary healthcare. A patient who receives service from a private healthcare institution before seeking primary healthcare will have to pay more money. Therefore, actions must be immediately taken to establish a tiered healthcare system.

Chinese health policy researchers should actively interact and cooperate with their international peers to introduce foreign good practices to China, while providing evidence and recommendations based on practical results to enable government's evidence-based decision-making.

- **Address health-financing through a sustainable perspective and establish a long-term medical insurance system**

China's health system is a combination of practices from various countries and its medical insurance system is also closely related to poverty alleviation programs. The medical insurance system is an institutional arrangement linking the level of economic development with that of healthcare. Poverty reduction programs are similar, which is also a long-term process. From a developmental perspective, China used its institutional strength to fight poverty—It first introduced universal insurance coverage to satisfy universal healthcare needs, thus reducing

the number of people impoverished by illness. While promoting health insurance, the Chinese government gives high priority to the financially disadvantaged groups of the population. With increased urbanization, an enormous number of rural residents have moved to cities, accentuating health insurance issues among these migrants. In response, the Chinese government adopted a two-pronged approach—On one hand, it has rolled out a new rural cooperative medical scheme for rural communities; on the other hand, it has removed institutional obstacles by lifting restrictions on rural people seeking jobs in cities and allowing them to enter the urban medical insurance system, which now covers 280 million people.

After a large number of migrants become urban residents, their medical insurance system must be integrated with urban systems, but they are still vulnerable in terms of health-financing ability. To address this issue, the government again introduced a critical illness insurance program to help migrant workers in need of hospitalized care, which is also part of the country's poverty reduction efforts. Despite these measures, the Chinese government still has pressing issues to resolve, such as how to address imbalances in healthcare and how to develop a long-term mechanism to prevent impoverishment by illness.

The development of Japan's medical insurance system can be divided into several stages. The beginning stage starts from 1961 to 1981, when the system featured expanding healthcare coverage and declining expenses. Between the 1980s and 1990s, when the percentage of elderly people exceeded 10%, Japan started to increase investment in elderly care and established a pension system in 2000. In the future, people are expected to live longer, which will need sustainable, long-term medical support from the health system. Therefore, health insurance alone will not be enough to address the issue; it also requires input from other fields, such as pension insurance and taxation.

Thailand is a champion of "Health Beyond Health", valuing the health sector's cooperation with other domains. In terms of sustainable UHC, participants shared two inspiring perspectives—First, don't put all resources in the hands of doctors. In Thailand, 50% of home care is provided by nurses, not by doctors. Medical training should be provided locally, as this practice will help keep medical manpower nearby. Second, provision of health service should not be solely based on economic and profit considerations. Thailand has created the Thai Health Promotion Foundation and the Health Intervention and Technology Assessment Program. Every year, pays USD 5 to 6 billion in medical expenses. In addition to disease treatment, 50% of its funds are used to promote health. Local governments also need to fund health promotion, which is part of a community-based health initiative. The funding is limited, but it serves to make communities become part of "Health Beyond Health" efforts.

It's also a common consensus among participants that it's important to recognize equity in the system and difference in the stage of development as well as the distinction between an equal, universal system and a diversified support mechanism. Health financing should not be regarded as an investment, but as a financial issue that also emphasizes cost control, performance and return. This means that the purchase of medical services must be efficiently managed; that such finance should be treated as a resource; and that the purchase of medical insurance should promote the pursuit of quality and innovation in medical products and services, while advancing the reform and development of health service delivery. Only in this way can health-financing play greater roles.

2.2.5 Aging

With the diversification of aging problem in modern society, we must have an overall consideration of this problem rather than propose policies and solutions based on some typical cases. Apart from being physically healthy, the elderly should also be able to do more valuable things and lead a more meaningful life,

including staying socially active. Here are five priorities when it comes to addressing an aging population. Political will: Ensure government's understanding of the importance of the issue, reshape people's thinking on the issue, and rethink what it means to get old in the 21st century; Build a supportive environment that can keep the elderly healthy;

Build a medical system that can better protect the health of the elderly. Shift the emphasis from the response to acute diseases to more personalized treatment. Pay more attention to the treatment of chronic diseases; Make sure every country has proper long-term care in place to sustain the elderly and guarantee their lives with dignity; Explore the issue of aging in the context of global strategies.

In response to this growing problem, a session on Aging was held on the morning of June 12, 2019, with panelists sharing constructive views.

- **Take systematic actions and build an elderly care system supported by the whole society**

In 2013, member states of WHO Western Pacific Region adopted a regional framework for action on aging and health. In February 2019, the newly elected WHO Regional Director for the Western Pacific began his term and launched a vision statement, which identified aging population as one of the four priorities. One of the implementation strategies is to take systematic actions to address aging. Here are two key points for this approach based on Universal Health Coverage: Think over how to meet the increasing needs of the aging population while implementing the UHC, and constantly take into account the emerging needs while designing the health system; otherwise, UHC would be a mission impossible. For example, China has unveiled a comprehensive system integrating elderly care and social security; UHC emphasizes partnerships and multi-sectoral collaboration. Since aging is a social issue beyond health, it is necessary to consider what services should be provided.

Longevity should be regarded as a good thing in terms of social policies and individual participation in social activities. Given the fact that our society is evolving all the time, it is important to fill the gap in workforce while up-skilling the elderly and improving their lifestyle. We should regard investment in tackling the aging issue as a share of contributions to the country's future economy and security.

Mental health of the elderly also deserves great attention. Mental illness is closely related to suicide risk. Research findings show that in China, among the elderly who have committed a suicide, at least 94% were suffering from moderate depression, and 60-70% were struggling with major depression. According to epidemiological studies, 30% of people aged above 60 in China are suffering major depression. That's why mental health should be included in comprehensive prevention and intervention efforts as well.

Emerging technologies and industries play a vital role in addressing an aging population. We need to connect families, rebuild communities filled with warmth, love and respect, and shape an elderly care system supported by the entire society. We are also required to redesign the financing system for health care. Our nursing system should be built on communities instead of hospitals and doctors.

- **Rethink the aging issue by shifting focus to prevention**

Demographic change also impacts people's needs for health or medical care, which are divided into three groups, as shown in the Figure 2-4. The first group

includes those aged above 60. They face the threat of certain chronic diseases that are more than often inevitable. The point is how to provide this group with better care services so that they can live comfortably even when they are ill. Among the second group are those aged 40-60. It is important to identify this group and their needs before it is too late, for instance, the disease occurs. So efforts should be made to carry out early screening and ensure they have access to proper health services. The third group is the younger ones. To address aging and chronic disease management, it is essential to change people's values and value systems. The aim is to help them see health as valuable as wealth, and take different strategies to meet different challenges throughout their lives. The biggest challenge at the moment may come from young people aged 30 or below, whose values about aging need to be changed.

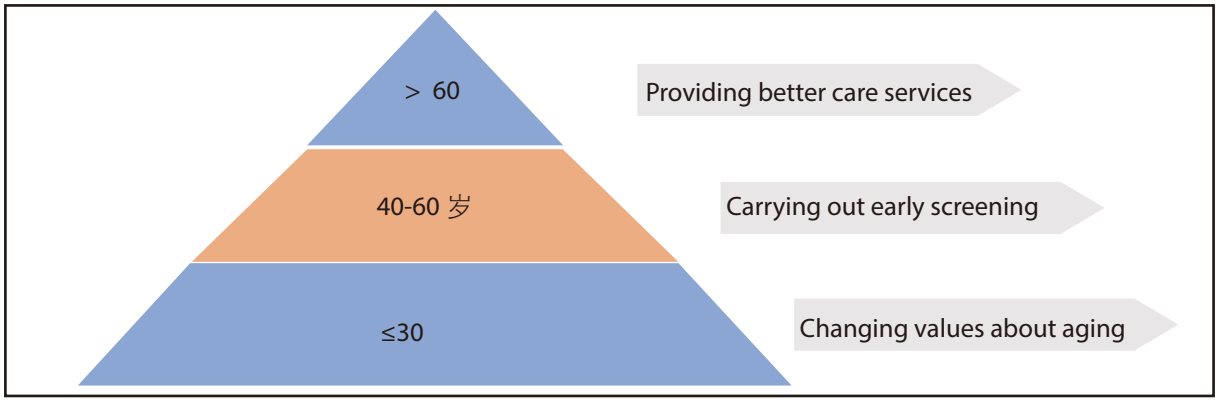

Figure 2-4 Aging-related needs by three groups

At the cellular level, the decline or complete failure of cell function with aging will lead to body dysfunction. The metabolism of proteins and nucleic acids also declines with age. And if infections or metabolic disorders are under control, it is possible to reduce the incidence of major diseases and improve the health of human. That's why a healthy lifestyle is so important. In a word, prevention comes first if we want to make the aging body healthier and younger, and reduce the burden on households.

2.2.6 Primary Health Care in the Era of Chronic Non-communicable Diseases (NCDs)

Today in many countries, chronic Non-Communicable Diseases (NCDs) have replaced infectious diseases as the most serious health challenge. On the morning of June 12, 2019, the First Conference of Global Health Forum of BFA had a discussion on Primary Health Care in the era of chronic non-communicable diseases. Build a medical system that can

- **Drive data-enabled management of NCDs by leveraging advanced information technology**

The patients already diagnosed with NCDs only represent a small fraction of the whole picture. In fact, a number of healthy people are at risk of such diseases and are likely to suffer from some non-communicable disease at a later stage of their life. How to reverse this trend? More needs to be done to prevent the occurrence of this disease while providing a wider range of primary health care for those patients with NCDs. Actually, patients need to spend a lot of time and energy managing their diseases. Therefore, it is vital to figure out how to help these patients better manage their health so that they can be energized enough to take care of their families, rather than become a burden.

And in some cases, a patient may be suffering from multiple chronic diseases. Every country is therefore advised to establish a specialized and efficient agency to guide and support the patients with chronic disease in their disease management, providing or suggesting right medicine for them and building an integrated (not fractured) and inclusive health care system.

Data use and analysis are vital to the fight against NCDs, noted some panelists. First, clinical data analysis can improve health care sustainably, identify the possibility of NCD occurrence and take precautions. Second, data research contributes to addressing the issues associated with NCDs while enhancing the entire health system to make it more responsive to the treatment and management of these diseases.

- **Strengthen Primary Health Care for more integrated responses to control NCDs in the first place**

To achieve Universal Health Coverage, priority should be given to increasing the accessibility, affordability and sustainability of heath care, and focus should be shifted to health management. Meanwhile, communities should take the responsibility of Primary Health Care by mobilizing the civil society, driving collaboration between family doctors and hospitals and offering customized solutions based on the actual situation of patients, in an effort to provide quality but affordable care. After taking into account various factors, a country should pay particular attention to the affordability of diagnosis and treatment associated with NCDs and build a more integrated, inclusive and sustainable health care system. In addition, it will be unnecessary to diagnose and treat a chronic non-communicable disease at a higher-level medical institution if a good job is done with regard to Primary Health Care.

Some panelists put forward the concept of Smart Prevention where new technologies are used to change the trend of a non-communicable disease at its source. Personal prevention is not only about managing and providing suggestions on the patient's condition, but also about giving advice concerning how to prevent them from catching this kind of illness in the future. In doing so, the development trend of NCDs could be changed fundamentally, thus reducing the number of patients suffering from this disease.

When it comes to public-private partnerships, the private sector, which owns necessary expertise, should also focus on Primary Health Care. The governments expect a reasonable price, an adequate deal and a sound agreement, while the private sector hopes to partner with credible governments within a sound legal framework. Given the global presence of the private sector, some best practices can be duplicated and applied in their collaboration with different countries.

2.2.7 China-Japan Life Sciences and Health Care Industry Development Forum

With rapid industrialization and urbanization, as well as an increasing number of aging population, chronic non-communicable diseases (NCDs), especially cardiovascular and cerebrovascular diseases and cancers, have become a key threat to public health. The situation of comprehensive prevention and treatment of NCDs and health intervention of the elderly is grim. In recent years, health issues have increasingly become a global focus. But at the same time, technological breakthroughs in cell biology have been made at a staggering rate. In particular, Japan has made impressive progress in such fields as regenerative medicine and T-cell therapy. On the afternoon of June 12, 2019, China-Japan Life Sciences and Health Care Industry Development Forum was held successfully. By holding this forum, China and Japan are expected to build a new international cutting-edge platform for academic and health industry development, which can in turn help reintegrate public policies, business models and technological innovation between the two countries.

Work together on immunotherapy for cancer

Since 1984, Japan has enacted laws that require further improvement in medical standards while ensuring that cancer patients can lead a quality and active life. Thanks to deep cancer insights and continuous improvement of cancer therapy, the survival rate of cancer patients has been on the rise. Cancer is no longer that terrible, to which prevention and early detection matters a lot. Therefore, how to detect cancer on an earlier date and at a lower cost will be a key issue to be addressed for technological development in the future.

So far, there have been three major approaches to cancer treatment: surgery, chemotherapy and radiotherapy. Many research teams have discovered the fourth approach – immunotherapy – to significantly improve the outcome, but its effectiveness is only somewhere between 20% and 30% at the moment. Making immunotherapy more effective requires further research involving various stakeholders. Meanwhile, there appears another game-changing therapy in America and Europe that has reached the third stage of R&D. By directly attacking cancer cells while leaving other cells unaffected, this affordable treatment will be available to patients soon.

A fundamental goal of future cancer treatment is to cure more patients. China and Japan can work together in this regard, including exchange of skills and talents, to shape an effective mechanism that will benefit more patients.

Cooperate in the field of cell therapy

The approach to healing the lymphatic system by introducing T cells has been recognized in America and Europe for its excellent performance. That's why Japanese pharmaceutical companies have introduced an automated and closed culture system based on the characteristics of cell therapy, and built manufacturing facilities that are up to global GMP standards. Additionally, these facilities apply IT and AI in the monitoring, production and cultivation of T cells in order to improve their quality. The above facilities and methods are expected to develop safe products for cell therapy and related products in the new medical industry. As a result, cell therapy will become more reliable and affordable. Japan is happy to cooperate with Qingdao's health care sector in these fields.

Industrialize health management and integra ted medical care and elderly care

China is in a process of rapid aging. Healthy life expectancy (HALE) is a matter of quality of life. The current vision is to allow the elderly to enjoy HALE while extending people's life expectancy. The Chinese government has put forward a series of national-level development strategies for healthy aging, including exploring a system to promote healthy aging, improving the responsiveness of the health system, and building a socially supportive environment and a dedicated system for the elderly. Health management of the elderly over 65 years old is a priority of health services. So how to improve such management services is the first thing to be considered by the government.

Integrated medical care and elderly care is a policy proposed by the Chinese government to allow the elderly to enjoy a healthy life. At present, there is a need to continue to explore a new pattern. Relevant entrepreneurs should consider how to industrialize health management and make it more specialized as

required by government policies. The good news is that some local governments in China have taken several policy measures to support the development of the health care industry, including simplifying the approval process, providing financial support, and exploring the establishment of a long-term care insurance system.

Much more needs to be done in the development of China's health care and sanatoria industry. It is advisable to draw on the proven experience of Japan and strengthen cooperation with health care communities at home and abroad, so that the elderly can age well.

2.3 Special Case Study: Traditional Medicine

It is an important issue for traditional medicine around the world to achieve strategic goals such as "Universal Health Coverage" and "Health for All" by fully leveraging its role in primary healthcare. The Global Health Forum of Boao Forum for Asia (GHF) has been monitoring the issues related to traditional medicine. With the strong support of the National Administration of Traditional Chinese Medicine, a session on Traditional Chinese Medicine was held during the first conference of GHF, inviting participants to explore the integration of modern medicine and traditional medicine into the healthcare system. It aims to jointly promote the development of traditional medicine and call on countries to take appropriate measures to include traditional medicine into their national healthcare systems so as to promote universal health coverage.

2.3.1 Definition of traditional medicine

The World Health Organization defines traditional medicine as "the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness".

2.3.2 Application of traditional medicine in the world

Dr. Zhang Qi, Director of Traditional and Complementar -y Medicine Unit (TCM) of WHO gave an update on the latest WHO Global Report on Traditional and Complementary Medicine, which shows that traditional medicine is increasingly valued in every country according to the information provided by 179 WHO member states in the survey. As of 2018, 88% of the WHO member states had applied traditional and complementary medicine, among which 107 member states had set up national offices for it, an increase of 18 from the year of 2012; and 98 member states had formulated national policies for traditional and complementary medicine, an increase of 19 compared to the year of 2012. The development of traditional and complementary medicine is also reflected in the rapid increase of the number of research institutions. Seventy-five member states have set up their national research institutions for traditional and complementary medicine, while the number was 58 in 2005. In addition, the member states have improved their norms and regulations regarding the development of traditional medicine: 109 member states have enacted laws and regulations on traditional and complementary medicine; 125 member states have established a herbal medicine registration system; 45 member states have included traditional and complementary medicine in their medical insurance system and 34 member states have incorporated herbal medicine into their list of

essential drugs.

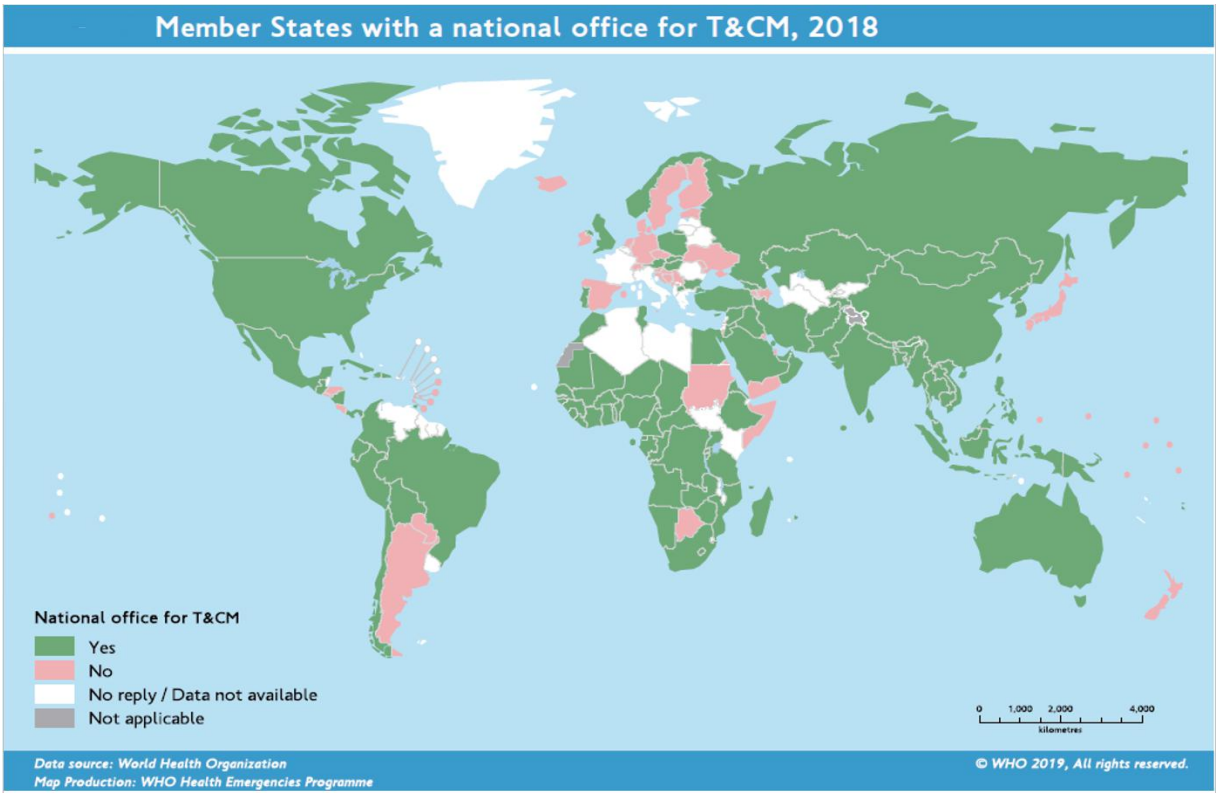

Figure 2-5 Member States with a national office for T&CM, 2018

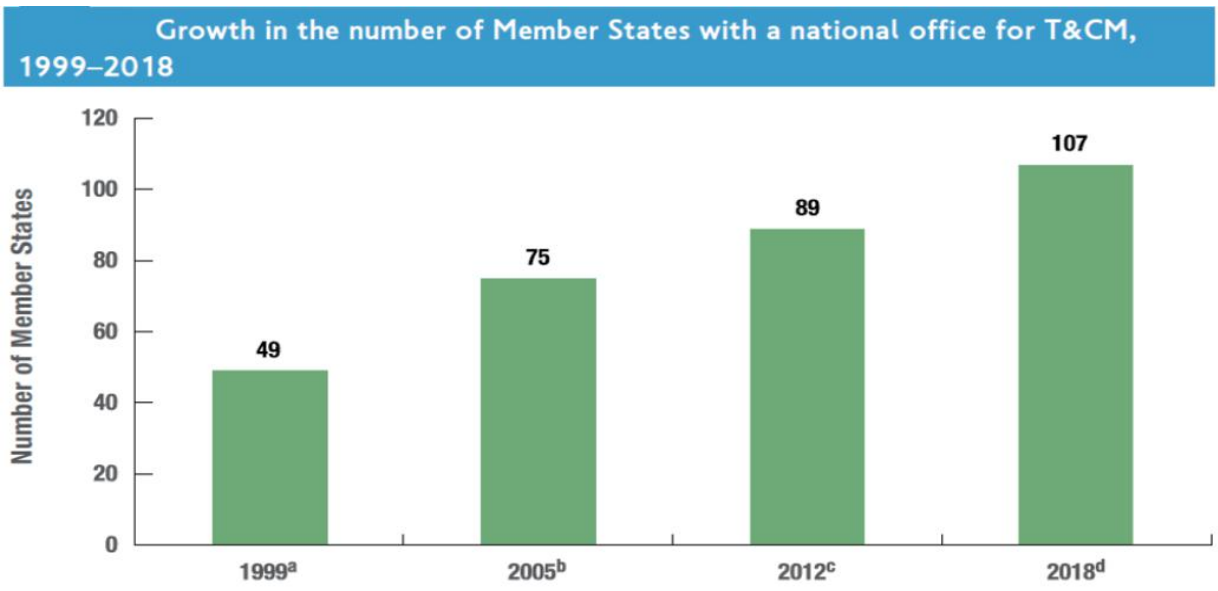

Figure 2-6 Growth in the number of Member States with a national office for T&CM,1999-2018

2.3.3 Traditional Medicine included in the Eleventh Revision of the International Classification of Diseases

The World Health Assembly Resolution on Traditional Medicine and WHO Traditional Medicine Strategy (2014–2023) were passed by the World Health Organization respectively on the Sixty-second World Health Assembly (WHA62) and the Sixty-seventh World Health Assembly (WHA67) with an aim to promote the global development of traditional medicine. The Seventy-second World Health Assembly (WHA72) reviewed and passed the Eleventh Revision of the International Classification of Diseases (ICD-11) on 25 May, 2019. This was the first time for traditional medicine, which originated in Traditional Chinese Medicine (TCM), to be included in the ICD. The World Health Organization pointed out that ICD-11 classifies traditional medicine conditions that originated in ancient China and are now commonly used in China, Japan, Republic of Korea and other countries. The inclusion of a supplementary chapter on traditional medicine in ICD will for the first time enable counting of traditional medicine services and encounters, measurement of their form, frequency, effectiveness, etc, comparison with mainstream medicine and research.

The ICD, formulated and promulgated by the WHO, is an international standard for diagnostic classification system. It provides a normative yardstick for classification of diseases in the fields of healthcare, management, teaching, research and policy-making around the world and is considered one of the most authoritative basic and general standards in the field of global health. Dr. Zhang Qi, Director of Traditional and Complementary Medicine Unit (TCM) of WHO said that the inclusion of traditional medicine in the ICD marks the recognition of the value of traditional medicine originating from TCM and by the international public health system represented by the WHO. It also marks the recognition of the increased application of TCM in China and the rest of the world.

The International Classification of Diseases has been revised 10 times in the past ten decades, and the 11th revision was launched in 2007. Under the leadership and technical guidance of the WHO and thanks to the joint efforts between China and other relevant countries, the Eleventh Revision of the International Classification of Diseases (ICD-11) has established a disease and syndrome classification system that is based on Traditional Chinese Medicine and takes into account the content of traditional medicine in Japan and Republic of Korea. A total of 150 diseases and 196 syndrome items of traditional medicine are included in the chapter of traditional medicine of ICD-11, which allows people to go beyond China to collect the data on the effectiveness of TCM for specific groups and diseases, thus providing a larger amount of reliable evidence for clinical TCM research.

2.3.4 Current Status development of Traditional Chinese Medicine Overseas

"The Chinese government considers Traditional Chinese Medicine as an important resource of health and a part of the solution to healthcare for its large population, and has explored a way to promote health and healthcare with Chinese characteristics," said an official from the National Administration of Traditional Chinese Medicine. As a key component of China's effort to promote public health with Chinese characteristics, Traditional Chinese Medicine has unique advantages and value in the implementation of the Healthy China strategy. The Chinese government has built a TCM service system covering both the urban and rural areas, where TCM is providing a higher share of services at a lower cost. In the recent decade in particular, the medical services provided by TCM institutions have increased from 14.3% in 2009 to 16.1% in 2018 as a ratio of the total sum of medical services. Medical expenditure per outpatient in public TCM hospitals is 10.8% lower than that in general public hospitals

and medical expenditure per inpatient in public TCM hospitals is 24.7% lower. TCM has opened up a unique model and path for a big developing country to help its people maintain health, prevent and treat diseases.

Traditional Chinese Medicine belongs not only to China but also to the whole world. It has played an active role in promoting the health and well-being of people around the world. Up to now, TCM has spread to 183 countries and regions in the world. China has signed cooperation agreements with more than 40 foreign governments, regional authorities and international organizations, and supported the establishment of 30 high-level Traditional Chinese Medicine Overseas Centers in countries along the "the Belt and Road" and built 50 TCM Exchange and Cooperation Bases within the country. In partnerships with 88 countries, these centers and bases have served more than 700,000 foreign individuals. While demonstrating and spreading TCM theories and China's traditional culture to the world, these centers and bases have made great contributions to human health.

"There are more than 800 registered TCM-related institutions in Singapore", said Prof NG Han Seong, head of TCMBranch of MOH of Singapore. Traditional Chinese Medicine is now the most widely used traditional medicine in Singapore. TCM clinics commonly exist in communities, allowing people to get medical services at their doorstep. The number of Traditional Chinese Medicine practitioners has also been on the rise in Singapore. By the end of 2018, the number of registered TCM practitioners had reached 3256, 30% of which have a bachelor's degree in TCM compared to 5% in 2006. The Singaporean government attaches great importance to the research of Traditional Chinese Medicine by allocating 3 million to TCM clinical research partnerships, which was followed by another appropriation of 5 million in 2017.

TCM education is gaining momentum in Thailand. According to Sumalee Chaisuparakul, President of Chandrakasem Rajabhat University, there are nine universities in Thailand that offer degrees in Traditional Chinese Medicine. Since 2015, TCM doctors have been allowed to open private clinics as long as they are officially licensed. Acupuncture is accessible in most western hospitals. "Traditional Chinese Medicine has a promising future in Thailand, and it is also of great benefit to the health of all mankind".

2.3.5 Highlights

- **On March 12, 2019, China's Evidence-based Medicine Center of Traditional Chinese Medicine was unveiled in Beijing.**

Huang Luqi, academician of the Chinese Academy of Engineering and President of the China Academy of Chinese Medical Sciences said that the establishment of China's Evidence-based Medicine Center of Traditional Chinese Medicine aims to obtain high-quality clinical evidence for TCM research. Professor Liu Jianping from Beijing University of Chinese Medicine suggested that in order to promote the next stage development of evidence-based research of Traditional Chinese Medicine, relevant guidelines and policies should be in place, clinical evidence available at present should be summarized, clinical experiments should be designed and implemented in line with international and national standards, and a comprehensive and detailed method should be used to fairly evaluate the medical practices of Traditional Chinese Medicine, while taking into account social and cultural contexts.

- **After issuing the TCM Guidelines for Prevention and Treatment of Diabetes long ago, China has recently published the Clinical Guidelines of Chinese Medicine on Sub-health, showing that our country is taking effective measures to prevent diseases from happening.**

According to Liu Jianping, our current medical system cannot solve many problems unique to an aging society. It is a common aspiration of the international

community to prevent these diseases through non-drug therapies. For example, practicing Tai Chi can effectively prevent elderly people from falling down and can even reduce the occurrence of menopausal syndrome and Parkinson's disease among the elderly. As a result, many overseas Confucius Institutes are teaching Tai Chi. Zhang Qi said that the World Health Organization is working with China in carrying out a "Tai Chi for Health" project, which aims to study how Tai Chi can promote the health of people, especially the elderly, on a global scale. "Traditional Chinese medicine can be a key contributor in achieving the goal of Universal Health Coverage".

- **We should make full use of the insights from traditional medicine to contribute to human health in the future.**

"The purpose of practicing medicine is shifting from treating diseases to maintaining health, and the idea of treating and preventing diseases in Traditional Chinese Medicine is the essence of health science". Li Candong, President of Fujian University of Traditional Chinese Medicine believes in unprecedented opportunities for Traditional Chinese Medicine.

- **Rehabilitation is an important area where Traditional Chinese Medicine can make a difference**

According to Mr. Christoph Gutenbrunner, Chairman of the Global Rehabilitation Alliance and professor of Medizinische Hochschule Hannover, rehabilitation is an important area where Traditional Chinese Medicine can make a difference. Western medicine pays more attention to physical functions, thus sometimes ignoring certain long-term or chronic health hazards like mental issues, lack of sleep, etc., which can be treated by Traditional Chinese Medicine. Many people in Germany incline to use traditional medicine, especially Traditional Chinese Medicine. "We hope that Traditional Chinese Medicine can be integrated into the rehabilitative care of Western medicine, and at the same time the concept of rehabilitation of Western medicine can be organically integrated into Traditional Chinese Medicine. We should cultivate and train more doctors or healthcare providers who can practice Traditional Chinese Medicine in Germany and other western countries. They need to master and combine Traditional Chinese Medicine and Western medicine, and provide personalized therapies for patients".

Chapter 3
Innovation for Health

3.1 Overview

The Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property, adopted by the 61st World Health Assembly in 2008, is designed to promote research and development, build and enhance innovative capacity, and manage intellectual property to facilitate innovation and improve public health.

The Global Innovation Index 2019 (GII) published by the World Intellectual Property Organization looks at the medical innovation landscape. GII reveals that the promotion of innovation in the health sector is lagging behind others. Even economies with advanced healthcare systems face obstacles to diffusing and sustaining health innovations. In the meantime, transferring medical innovations to developing countries can take longer. Large parts of the population in those countries still lack proper access to health technology and basic healthcare. Medical innovations are critical for closing the gaps in global healthcare provision. These innovations are happening across multiple dimensions, including core sciences, drug development, care delivery and organizational and business models. If the existing technologies and practices are extended to the field of health, they will surely reduce health care costs, improve health care efficiency and produce considerable outcomes for the healthcare industry. If the existing technologies and practices are extended to the field of health, they will surely reduce health care costs, improve health care efficiency and produce considerable outcomes for the healthcare industry.

At present, health-related innovations are mainly connected to machine learning, data mining, and cloud computing and other emerging technologies. Genomics, transcriptomics, epigenomics, proteomics, and metabolomics continue to evolve into key fields of innovation for health[9]; Major medical breakthroughs are on the horizon in the fields of genetics, stem cell research, nanotechnology, biologics and brain research; Medical devices, medical imaging and diagnostics, personalized medicine, and regenerative medicine will set off a new wave of innovation; Building on software-based modeling and artificial intelligence, some new healthcare research and services have also emerged to enable organizational and process innovations.

Innovations in pharmaceuticals, biotechnology, and medical technology have been growing strongly year-over-year in the last decade. Medical technology patents grew the fastest at close to 6% per year. This puts medical

9 : [AN Shaowei. Integration of Multi-Omics Big Data for the Promotion of Healthy Human Lives in theFuture [J]. Technology Review, 2019 (06): 12-14.]

technologies among the top five fastest-growing technology fields since 2016. Overall, the healthcare sector has emerged as one of the most important areas for investment and innovation. Pharmaceutical, biotech, and medical device firms are among the top global corporate investors in R&D, spending over USD 100 billion annually. Research and development in the health sector is booming.

Against the above background, the first conference of the Global Health Forum of Boao Forum for Asia addresses "Innovation for Health" as one of its three major topics, and promotes health care programs worldwide through innovation research, industrialization and international cooperation in the health sector.

3.2 Session Highlights

3.2.1 Development and Application of Innovative Technologies in the Field of Life Sciences

The 21st century is the century of life sciences. Innovative technologies have mushroomed for application, which gives rise to products and solutions in life sciences. To promote the sustainable growth of life sciences, a session on "Development and Application of Innovative Technology in the Field of Life Sciences" on the morning of June 10, 2019 discussed latest developments and commercialization of cutting-edge innovative technologies in life sciences from perspectives of innovation, funding, commercial application, intellectual property rights, and market development.

- **Innovation promotion requires support from policy, intellectual property rights, and the market**

Developing new products and technologies in life sciences is a complex activity that requires support from all stakeholders. The first is policy support. Policies must be put in place to support life sciences innovation and application. The second is effective intellectual property protection. Research and development of new products and technologies require the support of universal rules for protecting intellectual property rights. Moreover, the market should be capable of absorbing new drugs and technologies. Before deciding on which innovative product or technology to work on, it is wise to conduct a market research to engage consumers and understand their ideas, so as to align product value with market needs. Once the right market is clear, it is advisable to launch the new product as swiftly as possible. Given the fact that markets are constantly evolving and changing, the "lab-to-market" speed can make or break a product. Once available in the market, it is often necessary to make adjustments to pricing and partnerships to create favorable conditions for commercial promotion of the product or technology.

- **Innovation promotion needs a balance between short-term wins and long-term investment.**

Innovation is driven by capital and economic returns. Adequate financial support is the basis for innovative research and development, while economic returns are a necessary requirement of R&D teams. However, we must bear in mind that financial gains should not become the main driving force for innovation. Technology outputs are also driving forward innovation. For example, medical robotics reduces the cost of surgery, shortens the training time for doctors, and enhances doctor's skillsets. Sustainability is another key driver for innovation. The medical industry is valuable in serving the human society. The pressure

from a growing population in an environment with limited resources necessitates sustainable solutions to pressing challenges.

Generally, it takes long to see the results of innovation. Nevertheless, it can bring greater value than economic gains. Balancing short-term economic returns and long-term innovation is thus critical to enable more innovation.

- **Digital technologies such as artificial intelligence will revolutionize care delivery**

Artificial intelligence analyzes and interprets health data to help patients know better their situation, understand necessary measures to be taken and get clear on how to monitor their illness and health status, thus increasing the standards and accessibility of medical services. In addition, digital technologies make telemedicine actionable in rural and remote areas, which will create value and drive innovation for the healthcare system.

3.2.2 Innovative Technology, Industrialization and Global Market

The booming innovative technology can't realize market value without commercial applications. In the process, regulations, technologies and funding are critical to deliver these technologies on the ground and promote them in the global market. On the morning of June 10, 2019, speakers at the "Innovative Technology, Industrialization and Global Market" session discussed how to leverage our global resources, insights and network to introduce internationally cutting-edge technologies in life science into China while accelerating growth of this industry.

- **Product-market fit is key to successful commercial application of innovative technologies**

Consumer insights are the basis for developing innovative products or technologies. Research and development efforts should start with a study of the market to determine the treatment process and identify the areas where the innovation project can make a difference. Take the aging society as an example. An aging population means a lot of societal impacts, including the change of physical appearance of the elderly. However, they still wish to show confidence, satisfaction and happiness in the way their look and appear. This potentially creates a huge market for regenerative medicine that uses non-invasive or minimally invasive methods to regenerate skin tissues, providing researchers and investors with a blue ocean for innovation.

In addition to market needs, it is also important to adapt to the local culture. When entering a foreign country or territory, the first step should be to understand and adapt to cultural differences, familiarize with local market leaders and quality of R&D talents, and share experience with the local team to improve efficiency.

- **Banks and investors go hand in hand in financing commercial development of innovations**

Due to the large investment and high risks associated with introduction of revolutionary technologies, it's become a common challenge worldwide to increase the accessibility and affordability in financing the commercial application or industrialization of technology outcomes. The case is especially true with China. There are two reasons for this: China's financial system is dominated by banks, with venture capital and loans merely accounting for 5-6%; venture capital investment is important for high-tech and innovative

firms to commercialize technology outputs. However, Chinese venture capitals tend to give icing-on-the-cake funding rather than financing those that are in need of "firewood-in-the-bitter-snow". Their risk-taking ability is relatively weak.

To increase the access to finance in the commercialization of technology, the investment and banking sectors must channel capital into innovative technologies. Firstly, venture capital firms should assume their intended role, i.e. taking risks. Secondly, commercial banks and venture capitals should complement each other's advantages in that venture capitals have more information than banks but fewer funds. This is greatly beneficial to the commercialization of innovative technologies.

- **Create a well-balanced environment for interna l and external innovation**

In any country, medical innovation requires a domestic platform that brings together experts, universities and medical institutions for independent innovation. However, this does not mean that we should close off all connections to the outside world. A country or region should instead open up to go global, focus on international resources and work with foreign institutions and experts to build an innovation ecosystem. Innovations and experience from another country can help enhance creativity and core competitiveness, providing a sound ecosystem for internal, external and cross-border innovation.

3.2.3 Medical Innovation and Development in the era of intelligence

Healthcare are a rising industry in modern economy. With rapid economic development, health has become one of the top concerns around the world, including in China. In recent years, China has continuously increased policy input and facilitation. Driven by the market and policies, China's pharmaceutical and health industry is showing stronger resilience and growth momentum. However, with huge opportunities and space for development comes fierce competition. Intelligent healthcare has emerged as a promising area for Chinese firms to enhance competitive edge, and it is becoming a new driver behind the Healthy China strategy.

On the morning of June 10, 2019, the "Medical Innovation and Development in the era of Internet of Things" session explored how to innovate and develop China's health care sector in the era of intelligence.

- **Technology-enabled and demand-driven medical innovation in the era of intelligence**

There are two driving forces for the development of medical innovation in the era of intelligence. As shown in the Figure 3-1, one is technology, including cloud computing, big data, the IoT, and genome sequencing, etc. Traditional medicine is evolving into innovative medicine through the application of these new technologies. The other is demand. "The Healthy China 2030" blueprint shows that Chinese people's needs for healthcare services have shifted from treatment of acute disease towards comprehensive full-cycle services across the continuum of care. Subsequently, medical services are not only about diagnosing and treating diseases, but also about disease prevention, health promotion, health education, rehabilitation, post-hospital nursing care and comprehensive care.

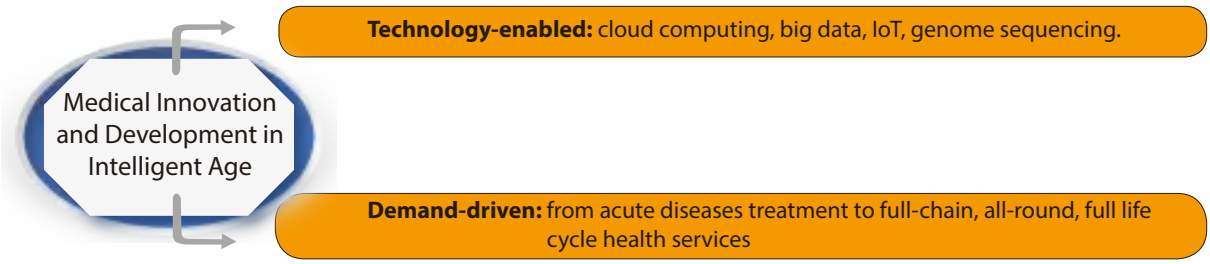

Figure 3-1 Two driving forces for medical innovation in the era of intelligence

Medical innovation of the era of intelligence, innovation will drive medical services towards intelligence and precision, transform health care models by mobile connectivity and artificial intelligence and achieve life cycle health management of individuals that is sophisticated, integrated and convenient. It is also conducive to expanding the coverage of health management, establishing a sound management model and risk assessment system, and promoting effective delivery of health management.

- **The use of Internet technology in hospital operational management for advancing health equity**

Nowadays, personal medical data can be recorded by a smartphone, which is then analyzed and evaluated to predict a possible disease. Subsequent actions will be taken based on these predictions, with the intent to prevent such disease from occurring. In China, tertiary hospitals are more willing to embrace Internet technology. However, they are designed to provide specialist, health services for rare diseases, complex conditions and critically ill patients. In other words, primary and secondary hospitals should also be brought into the picture for new technology applications in order to establish a health care ecosystem for life cycle care. The weakness in China's medical system lies in the low level of informatics in primary and secondary hospitals. In the future, more efforts should be made to improve IT applications in these hospitals and integrate them into the whole health system, with a special focus on primary health care. Meanwhile, block-chain technology can be used to upgrade and enable community medical institutions to reach the same level as tertiary hospitals in terms of information technology, thereby establishing an integrated hospital information management system. Only by bringing into full play the strength of hospitals at all levels can an IT-based "medical + health" model be fully implemented.

- **Innovation in intelligent healthcare requires on concerted efforts of government, business, academic and medical communities**

Promoting innovation in intelligent health care requires concerted efforts of government, business, academic and medical communities. First of all, national policies should be introduced to comprehensively promote the innovative development of smart health care. Secondly, local practices should be encouraged to produce effective demo and pilot projects; the government should play a dominant role by balancing oversight and innovation to ensure a sound and sustainable development environment; maintain a balance between open data sharing and privacy protection; enhance the theoretical research and technological innovation of smart health care; and facilitate resource integration to increase synergy among various stakeholders. Businesses, governments, research institutes, colleges and universities and

medical institutions should work together to pool resources for the development of interdisciplinary healthcare professionals.

3.2.4 Innovation Dialogue between China and EU in the Field of Life Sciences

Europe is home to highly concentrated biopharmaceutical clusters in the world. Here, innovations in the field of life sciences emerge one after the other, new drugs and medical devices are leading the trend, and intelligent and digital healthcare are rapidly developing. On the afternoon of June 10, 2019, scientists and entrepreneurs from China and the EU joined a dialogue on innovation in life sciences, shared experiences from both sides and explored further cooperation.

- **R&D and innovation for new drugs face three challenges: therapy, intellectual property and financing**

As shown in Figure 3-2, new therapies include immunotherapy, gene therapy, cell therapy, and therapeutic cancer vaccine, all of which are promising areas for cancer treatment. Further research and study are required to determine their working mechanism and side effects for comprehensive treatment of cancer. In addition, digital health and microbiome are brand-new fields that promise tremendous future prospects.

As global competition intensifies in various aspects of the economy such as intellectual property rights, several large firms are facing the unprecedented challenge of patent expiration. Once a patent expires, the competition between generic drug manufacturer worldwide and the pharmaceutical company will inevitably intensify. Protection of intellectual property rights needs to be strengthened for SMEs.

The EU financing ecosystem is relatively limited while the public market is rather fragmented and absent. As a result, biopharmaceutical sector in Europe lacks investment or the interest of major investors.

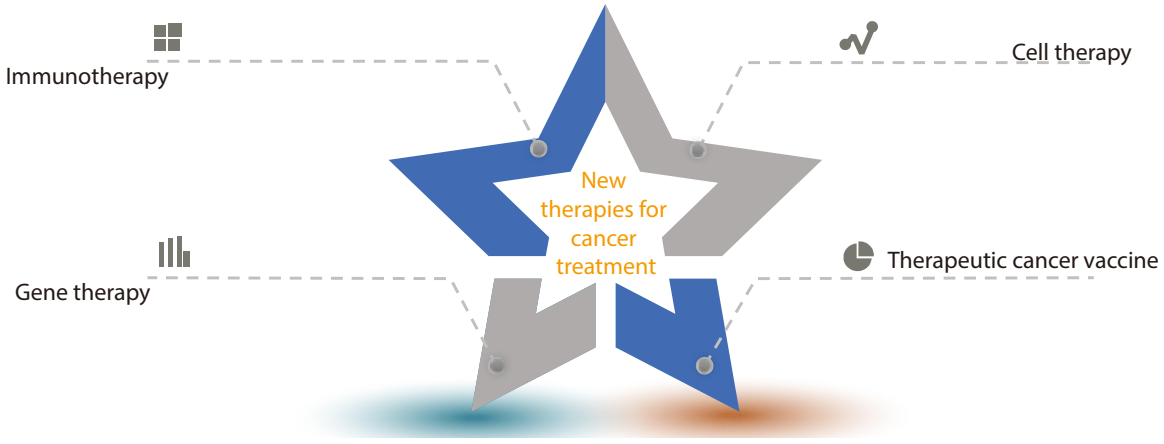

Figure 3-2 New anticancer therapies

- **Achieve win-win cooperation between China and the EU in technology and funding**

The lack of investment in Europe has drawn the attention of many Chinese companies and investors. China has a large population with strong demand for new technologies such as gene therapy and oncotherapy, while the European biopharma industry possesses proven expertise and research capabilities. There is much room for further cooperation between China and the EU in clinical development and commercialization of such technologies. If Chinese investment in the European market flows back to China in the form of new products or others, it will produce considerable as returns on investment. Both markets are highly complementary, which provides a good opportunity for investors to invest in each other and open up markets for new products. In the future, cooperation between the two sides will be further promoted.

- **Improve intellectual property rights systems for international cooperation in medical innovation**

Intellectual property is an important consideration for the China-EU cooperation in the field of healthcare. At present, the Chinese government has promulgated laws and regulations to protect intellectual property rights, raising awareness among the private sector and improving the overall environment. From basic research to market application, China and the EU are able to work together upon agreement on intellectual property rights. This will bring together different technologies for exchange and sharing, giving rise to better commercial applications. However, transferring European intellectual property rights to China may cause relatively high costs, which is a heavy burden for many Chinese companies. To reduce such costs and improve transfer efficiency should be one of the focal areas in China-EU cooperation.

Protection of intellectual property rights for SMEs in China and Europe requires interaction and coordination among the intellectual property rights community, SME support institutions, business associations, and national/local governments. Since IPR protection goes beyond any single country or locality, multilateral cooperation is necessary to establish a sustainable IPR system across the world.

3.2.5 The Opportunities and Challenges in the Global Medical Innovation Projects in China

The global pharmaceutical and health markets are undergoing profound changes. Amid the new situation, China needs to accelerate commercial application of research outcomes, set up a research-to-market pipeline, and promote industrial upgrade and iteration. Now is the best time to develop the health sector. China should accelerate integration, conduct extensive cooperation with an open mind, break cultural differences, respond to resource challenges, and promote international exchanges and cooperation. On the afternoon of June 10, 2019, the "Opportunities and Challenges in the Global Medical Innovation Projects in China" session offered an opportunity for global stakeholders to learn about the Chinese market.

- **Chinese market and policies create huge opportunities for medical innovation projects**

As people pursue a higher quality of life and health, the health sector grows rapidly. The huge market in

China allows for great potential for the industry to prosper. The Chinese government has issued policies on the review and reform of innovative drugs and medical products, in an effort to vigorously reform the drug regulatory system and increase the access of foreign innovative medical products to China's market. The grand vision of a Community of Shared Future and the Belt and Road Initiative have also created unprecedented opportunities and conditions for deeper integration and cooperation between Chinese firms and their international counterparts.

Chinese homegrown companies have explored new paradigms of international cooperation from being merely a raw material supplier to expanding into the downstream of industry chain. Chinese companies are building up their capabilities in integrating global resources, which have resulted in the inflow of capital and resources from all sides.

Upgrading and transforming home-grown businesses enables China's health industry to boom with opportunities and prospects. Industrial upgrading and transformation are becoming the mainstream of the business. After several decades of development, China is moving gradually from generic drugs towards targeted drugs and biomedicine. The use of medical devices is also an important part of the process. With the advent of 5G technology, artificial intelligence, Internet of Things, cloud computing and other technologies can be used to enable unlimited collection of data from medical devices, remote diagnosis and monitoring, and AI-assisted diagnosis. At the same time, it opens up a hundred-billion-worth market of portable, smart hemodialysis equipment. 3D printing and new materials drive personalized medical treatment, playing important roles in dentistry, orthopedics and aesthetic surgery.

- **Drug development requires joint inputs of policy, intellectual property rights, education and investment**

Drug development requires close cooperation among drug research institutions, distribution companies and medical service providers. In addition to investment, R&D and clinical development, the process also depends on the support of soft resources, including national health insurance policies, approval systems, production models, and intellectual property rights protection. The current education in pharmaceutical science deviates from the actual drug development practices. This is not conducive to the cultivation of a highly skilled workforce in drug research and development, which will ultimately affect sustainable drug development and commercialization.

To accelerate commercialization of research results, measures should be adopted on multiple fronts. In terms of policy, the Chinese government should formulate policies for health insurance coverage and application of home-grown innovative drugs while opening up unique channels for drug companies to gain profit, thus promoting drug research and development. Drug research requires breakthroughs at the source, and innovations in intellectual property rights, so that the drugs can get the original patent of IPR. Also, education in pharmaceutical science should be reformed to combine teaching with practice, establish bases for integration between industry and education, and develop an ecosystem of clinical research and drug development. Finally, given the long cycle of drug development, government and corporate investors should adopt a long-term perspective and balance short-term gains with long-term impact.

- **Build an industrial platform to promote communication on pharmaceutical innovation between China and the rest of the world**

Generally speaking, the main actor of innovation is small and medium-sized enterprises (SMEs). The development of SMEs depends on professional service platforms and industry parks with integrated innovation resources. The Wuhan National Bio-industry

Base in the Optics Valley stands out as a success case of industrial platform built on the basis of industry-university-research alliance. With 33 service platforms and 11 accelerators, the base offers proper solutions to Chinese or international innovation projects concerning intellectual property issues, licensing and commercialization. From universities, service platforms, manufacturers to the market, government, medical institutions, research institutes, and enterprises work together on a platform that gathers innovation resources to create a safe, healthy, scientific, and internationally aligned model, attracting innovation projects from across the world while driving for pharmaceutical innovations and ensuring economic returns for various stakeholders.

3.2.6 International Colloquium of Microbiomes

The impact of microbes on human health has been confirmed worldwide. They are everywhere in immunity, infection, response to chronic diseases such as cancer, autoimmunity, allergies as well as effects on metabolism and nervous system. The "International Colloquium of Microbiomes" session on the afternoon of June 10, 2019 invited experts, entrepreneurs and investors to discuss the topic from perspectives of research, funding and market and explore ways to develop microbiomics for the benefits of human health.

- **Microbiomes attract wide attention with good prospects**

In the past years, academic papers and research projects in the field of microbiomics have increased exponentially, drawing more and more attention and a growing number of investments. As part of precision medicine, microbiomes provide infinite possibilities for the world of healthcare. At present, there are many promising areas to be explored.

Firstly, Microbiomics for disease prevention and prediction. Previous research has identified and described the correlation between microbiomes and human health, but more can be done to clarify the underlying cause and effect relationship and mechanism in order to conduct predictive editing for improved treatment outcomes. By studying health-related microbiota in vivo, in vitro, and various human organs, it is possible to early prevent the occurrence or progression of diseases. For example, an experiment confirms that a correlation exists between the conditions of oral microbiota and dental caries. Therefore, oral microbiota can be used to predict dental caries at an early stage for early diagnosis and treatment.

Secondly, Microbiomes help treat NCDs such as cancer and type 2 diabetes. In the past decades, the incidence of infectious diseases has decreased while that of chronic non-communicable diseases has climbed. Microbiomes can provide inspirations for the treatment of NCDs. Take gastrointestinal cancer, one of the most active areas of microbiomics research as an example, transfer the tumor to mice, under certain conditions, the tumor and the bacteria can grow together. Mice are treated with antibiotics to kill bacteria and inhibit tumor growth. Microbiota-based antibiotics usage is a new idea for treating colorectal, rectal and gastric cancers. Microbiomics also inspires new treatment of type 2 diabetes. The conventional treatment for type 2 diabetes is medication. Microbiome-based experiments show that the color of microbiota changes due to drug effect. Transplanting the color-changing microbiota to germ-free bodies may be an alternative to treating type 2 diabetes or obesity.

Evolution is the basis of microbiomic research

Research from the New York University shows that human development has led to changes in the diversity of microbiota. It is lowest in American adults, and highest in people living in the Amazon basin area. By comparison, American adults have lost nearly 50% of the original microbiota than their Amazonian counterparts.

The development of human genome is rather slow, while microbiota evolves rapidly. As microbiota in human body adapts to the environment and diet, it deviates from the human physiological system, which leads to new diseases.

Development of microbiomics needs policy support and integrated resources

The government needs to provide policy and financial support for the development of microbiomics and the entire sector. International public-private cooperation can be applied to integrate resources, increase investments and accelerate technological progress so as to promote the development of microbiomics and inject new impetus into disease prevention and treatment.

3.2.7 South-South Cooperation in Healthcare Industry

Historically, most of the healthcare project partnerships have taken place between the North and the South. But today, South-South cooperation is increasingly demonstrating its impact in such regions as Africa and Southeast Asia. On June 12, 2019, the "South-South Cooperation in Healthcare Industry" session focused on challenges, experiences and solutions of South-South cooperation.

China's participation in South-South cooperation is important for global development

The international cooperation discourse used to be dominated by the western aid system. But with the development of China, a new discourse has emerged involving China's economic cooperation with and assistance to Africa. Under a multilateral framework, the two systems are rarely interconnected. China has rather different experiences and background from developed countries. As a developing country, it has become one of the high- and middle-income countries. From products, experiences to funding, China is well positioned to support other developing countries under the framework of South-South cooperation. On this basis, a third discourse system would be desirable, which could understand the current situation and put China's resources to good use. The main challenge now is to explore a partnership that will bring more Chinese practices and products to Africa.

PPP model engages private sector in international development assistance

At present, governmental donations account for a large part of international development aid, but the private sector is steadily increasing its contribution. Mobilizing the private sector for international aid is of great significance for South-South cooperation and development. In this regard, the Global Fund has adopted a Public-Private Partnership model (PPP), as shown in Figure 3-3.

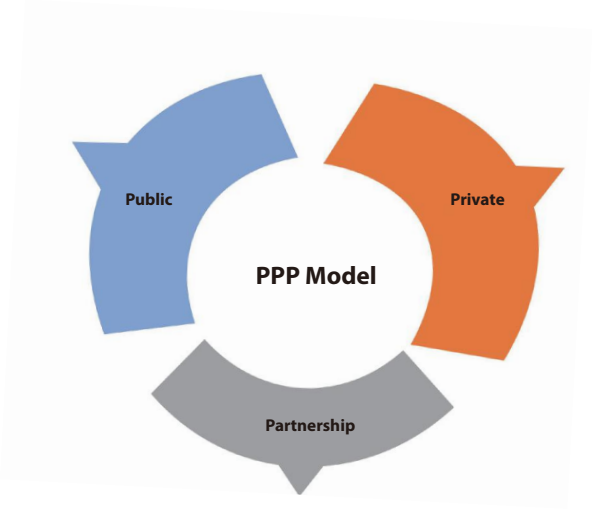

Figure 3-3 PPP model of the Global Fund

The Global Fund promotes the PPP model by means of financing and designs special financing tools for the private sector. For example, the social impact bonds for HIV high-risk groups in South Africa are invested by commercial companies. After several years of operation, the South African government evaluated the project and recognized that it has achieved the expected goal, and acquired the bonds at a premium, thereby achieving win-win outcomes between the public and private sectors. The general framework of international aid is undergoing structural adjustments. Although government continues to lead, the private sector is catching up. In the future, the PPP model will produce more profound impacts.

- **Improve regulation to help companies overcome regulatory barriers to pharmaceutical products**

Due to safety and efficacy requirements, pharmaceutical products face the strictest supervision of all, which means a global free market is difficult to take form. Therefore, regulation constitutes the biggest obstacle for pharmaceutical companies to enter the global market. To supply quality and affordable products to the global market, special support should be provided for companies specialized in malaria and vaccines to help them meet international regulatory requirements. Meanwhile, efforts should also be made to elevate the supervision and regulatory system to the international standards, in order to add such drugs to the global procurement list for the benefits of more enterprises.

- **Pharmaceutical localization drives employment and development in recipient countries**

In terms of international development assistance, international organizations, governments, businesses, and research institutions should work together with clear division of labor to establish a new value chain for product supply that extends to developing countries. From initial research and development, production, supervision, market launch to hospital, efforts should be made to build capacity across the continuum of pharmaceutical products in the recipient countries, so as to promote local production, make full use of local resources, improve health and drive employment and development.

3.2.8 Internet Age: Opportunities and Challenges

Artificial intelligence, the Internet of things, the Internet, big data, telemedicine, precision medicine, and a variety of other disruptive technologies are emerging, which brings great changes as well as challenges to the healthcare industry. What we need to do is to embrace the huge opportunities and address the challenges in the Internet age in order to promote development of the industry. To this end, a session on "Internet Age: Opportunities and Challenges" was held on the afternoon of June 12, 2019 to have a lively discussion around these topics.

- **Promote global health through AI-based digital health projects**

From a global perspective, international organizations such as the World Health Organization, governments, medical service providers and companies have conducted global, cross-sectoral and multidisciplinary cooperation in artificial intelligence, the Internet, and the Internet of Things. The World Health Organization and the International Telecommunication Union once proposed a joint initiative on promoting health programs through mobile connectivity and have launched a largest program worldwide for digital health——This AI-based digital health program is designed to help every individual improve health by communicating health information through smart devices such as mobile phones. The program is now available in 11 countries, delivering15 projects mainly aimed at smoking control, cancer and tuberculosis. Over 2 million people in India have quit smoking thanks to the smoking control project. Zambia's screening rate for cervical cancer has increased by 6% after a specific program for cervical cancer screening has been launched. Another 96 countries have expressed interest in the program.

- **Artificial intelligence will play an important role in disease prevention, monitoring and treatmet**

In the future, artificial intelligence will reach every corner of the world, playing an important role in a wide range of fields including disease prevention, health promotion, treatment of cardiovascular diseases and cancers, and disease screening, detection and diagnosis. More importantly, the technology can potentially streamline medical process for efficient diagnosis and treatment. Artificial intelligence also facilitates remote care for patients.

- **Engage multi-stakeholders including government, business, and academia to jointly manage the adoption of big data and artificial intelligence**

In order to address political, social, security and equity issues arising from the use of big data and artificial intelligence, the government should step in to ensure that in the stage of AI development and implementation, personal privacy is guaranteed under a sound legal framework. Stakeholders such as academia, the private sector, industry, and civil society should build mutual trust, work together to create a synergy, complement each other's strengths, and engage the disadvantaged in the collaboration.

Public-private partnerships represent a win-win scenario where every stakeholder has a role to play. The private sector is adept at developing new technologies, while the public sector paves the way for implementation by providing policy guidance and support. Take China as an example, where rural areas are often medically underserved. The private sector can conduct a field research to understand local needs and medical issues, and then employ artificial intelligence technologies to improve the situation. The public sector can provide policy support to bring doctors and patients together, integrate them into the development process, and make better use of new technologies and tools.

3.2.9 New Technology in Health Delivery

New technologies such as artificial intelligence, robotics, new therapies, new vaccines, and genetic technologies have seen applications in healthcare, creating a huge opportunity for the sector. Promoting development of new technologies and their application in the health sector and taking a people-centric approach in technology use can improve health and quality of life, contributing to the United Nations

Sustainable Development Goals. On the afternoon of June 12, 2019, the "New Technology in Health Delivery" session gathered a panel of experts to share their views on the topic.

- **Protect intellectual property rights for the application of new technologies in the health sector**

New technologies bring fresh prospects and novel applications to the health industry. They rely on innovation or invention, which is why they must be protected by intellectual property laws throughout their application. Therefore, the World Intellectual Property Organization (WIPO) provides researchers with platforms and facilities so that they can exchange views and discuss research results. In addition, the WIPO has established a patent database platform in partnership with several other international organizations. There are currently 130 members on this platform, most of which are from the pharmaceutical sector. The database provides members with free information and certain patent authorizations to support the commercialization of their research results.

- **Innovative products and technologies open up new frontiers for disease treatment**

Induced pluripotent stem cell (IPS) technology has produced quality products to treat Alzheimer's disease. Key clinical trials have been conducted. Photonics immunotherapy, after 24 years of research and development, has entered the application validation phase. It has proven to be highly effective in treating pancreatic cancer and liver cancer. Robotics has been applied in pathology and CT scans. It has also been increasingly used in surgery. Clearly, the above-mentioned innovative technologies and products are all injecting fresh blood into the current disease treatment.

- **Risks in artificial intelligence and robotics applications**

Applying artificial intelligence and robotics in the health sector requires personal data, which necessitates careful consideration of data quality and safety. If data and technology are not used properly, or abused for commercial purposes, our privacy will be put at great risk. These new technologies are used for treating human disorders, so market supervision is key to ensure safety. Regulatory measures and mechanisms must be in place for the application of artificial intelligence and robotics in medicine.

3.2.10 Leap Frogging Technology for Health: Malaria Case Study

In the past decade, technologies for malaria treatment have been advanced progressively. With the support of financial and economic policies and through joint efforts, the rate of malaria mortality has declined by 60%. This remarkable progress has become an outstanding success story in the public health sector across the world. Today, more than 200 million people worldwide are suffering from malaria, which leads to around 400,000 deaths annually. But malaria prevention and control is still seriously challenged due to the fact that funding and innovation are facing major bottlenecks. To address this issue, the "Leap Frogging Technology for Health: Malaria Case Study" session looked into malaria case studies with a focus on innovation, scalability and development models, which

will have a major impact on global public health and society.

- **Continuous innovation is a powerful driver for malaria eradication**

In the late 1950s, the use of mosquito insecticide and mosquito nets effectively contained the spread of malaria, until mosquitoes developed drug-resistance. In the early 2000s, anti-plasmodium vaccines were put into use, but anti-plasmodium developed resistance once again. Therefore, continuous research and development are essential for eradicating malaria.

Laboratory research and development can produce innovations to replace ineffective methods in countries that have achieved or are close to the eradication of malaria. This approach can speed up the process and save lives at lower costs. Mosquito-related genetic engineering research can be applied to develop single-dose delivery of a malaria transmission-blocking vaccine, which confers single-dose long-lasting protection, identifies symptoms of malaria, and achieves a more sensitive diagnosis.

In addition to laboratory innovation, policy and partnership innovations are also important to capacity building. First of all, the monitoring system should be systematically improved with digital technology and data to control malaria sites and other indicators, optimize resource allocation, and identify effective treatment tools through modeling. Secondly, partnerships among key areas and industries can also accelerate the eradication process.

- **Development of the malaria industry chain requires joint efforts in R&D, investment and market**

More innovation and research resources are required to reduce morbidity of malaria. Basic research awaits funding, while commercialization of innovations depends on market availability. Therefore, multi-stakeholder engagement is necessary to create a sound environment for developing an industry value chain for malaria treatment. The Global Fund, academic institutions, businesses, governments and civil organizations should work together to create more enabling conditions and develop more diversified resources including capacity building, disease control, disease and epidemiology management, supply and industry chains as well as grassroots and community resources. Only by combining these efforts can malaria be eradicated around the world.

- **Health systems provide an important framework for malaria control**

At the national level, a robust health system is important to address the challenges of diseases. One of the reasons for the spread of Ebola in West Africa is the weak local health systems that were incapable of coping with the outbreak. The same is true for malaria. Malaria diagnosis and treatment requires comprehensive, people-centered medical services enabled by an integrated health system.

3.2.11 Reinvented Toilet

"Reinvented Toilet" is an initiative to revolutionize toilets in developing countries with the aim to reduce diseases and the loss of dignity resulting from inadequate access to basic sanitation facilities. The toilet revolution will fundamentally change the health and sanitary conditions in every country around

the world. On the afternoon of June 12, 2019, the "Reinvented Toilet" session shared some best practices related to the toilet revolution to promote international health cooperation and trigger a worldwide revolution.

- **Reusing waste and wastewater matters in dry areas**

South Africa and Senegal are located in Africa, where the climate is dry and water is scarce. Conventional flush toilets would consumer too much water. To address this issue, South Africa introduced the use of wastewater, and proposed the practice of eliminating human feces from the source for recycling, which reduces pollution and saves resources. An example is extracting useful components from carbon-based substances in feces and applying them in other technologies. The country is also considering the possibility of introducing China's low-energy vacuum suction technology as an alternative to the water-flushing method. Independent of water consumption, this new type of toilets can produce huge social and economic benefits. Senegal's approach is similar. Recycling manure for horticultural fertilization on cocoa plantations not only solves the disposal problem, but also protects the environment.

- **The toilet revolution in resource-abundant areas is advanced in quantity, availability, function and management.**

Since 2015, Qingdao has launched a toilet revolution in accordance with national planning. Measures have been taken to increase the number of toilets as well as their availability in scenic spots, densely populated areas, urban-rural junctions, and old urban areas, and etc. In addition, attention has been paid to improving public toilet facilities. Finally, the local government requires a sophisticated approach to toilet management.

- **Cultural factors including women's rights, equal access and religious practices should be considered in the toilet revolution**

The poor condition of many public toilets leaves women vulnerable to sexual violence. Therefore, priority should be given to women's needs in the design and site selection of public toilets to protect women from sexual assault, such as the use of alarm devices, as part of the efforts toward female empowerment.

The rural-urban gap should also be considered in carrying out the toilet revolution. A well-functioning toilet solution in the city may be difficult to implement in the rural areas. Local conditions must be considered in the choice of technologies. In addition, the principle of equality should be included in the toilet options so that people in rural and remote areas can access the sanitation facilities at a lower cost.

The international promotion of the toiletrevolution must respect faiths, customs and habits of different groups of people. Before large-scale commercial application, it is recommended to conduct pilots in select countries and regions to improve health awareness and user experience.

- **Government partners with the private sector to tackle toilet challenges**

The task of addressing toilet challenges starts with policymakers. They need to better understand people's

needs and possible pathways of change. They need to work with the private sector to promote the toilet revolution on various dimensions including public education, capital investment, technology research as well as operation and maintenance.

3.3 Special Case Study: Online healthcare

With the iteration and advancement of mobile connectivity, especially with the arrival of 5G, it has become an irreversible trend to use the Internet and other information technologies to expand the breadth and depth of medical services, and build an online/offline integrated health care model that covers the entire pre-/in/post outpatient services. Significant structural changes are bound to occur in the field. Continuous innovation of technologies and maturing business models in online healthcare will maximize the standardization and connectivity of health data, thereby promoting deeper integration of medical resources for more convenient and efficient provision of healthcare services to the public.

In the battle against COVID-19 that broke out during the Lunar New Year in 2020, Chinese Internet companies have played a part in controlling the pandemic by supporting information communication, securing medical supplies, and offering online medical consultations.

The Global Health Forum of Boao Forum for Asia has been following topics related to the "online healthcare". This special case study, building on the discussions at the session, explores the definition, current status, opportunities, and challenges of the online healthcare.

3.3.1 Definition of the Online healthcare

The Online healthcare or the Internet + healthcare, in a broad sense, refers to various IT-enabled healthcare services provided through wearable devices and online platforms, including online diagnosis and treatment, remote support services and online healthcare consultations. Specifically, it enables health education, medical information access, eHealth records, disease risk assessment, online illness enquiry, electronic prescription, remote consultation, remote treatment and rehabilitation.

Online healthcare service users can be divided into three types, i.e. healthcare consumers/patients, doctors, and hospitals, as shown in Figure 3-4.

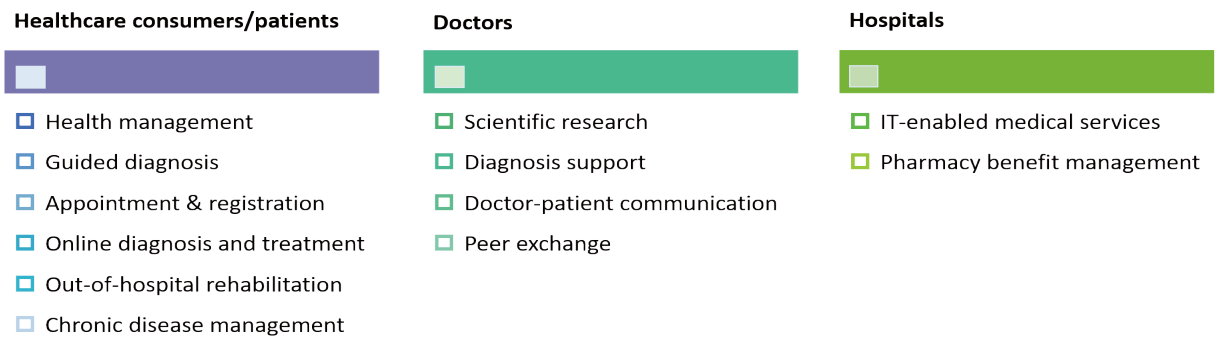

Figure 3-4 User types of online healthcare services

3.3.2 Current Status of the Online healthcare

● The United States

Online healthcare originated in the United States. In the early 1990s, the United States started to promote IT-based applications in the health sector by establishing central coordination departments, formulating special development plans, and introducing laws and regulations. Driven by sound policies, online healthcare services have now covered nearly every aspect of healthcare in the country.

Specifically, the US regulators have introduced the following policies to encourage and support the development of online healthcare.

• FDA supervision and regulation: As early as in 1989, the FDA issued a statement to help determine whether a computer- or software-based product is a medical device. After an explosive growth, medical device software business in the country gradually became complex and diversified. The FDA came to realize that a single regulatory policy was no longer sufficient to manage all types of medical devices, therefore abolishing the statement in 2005. In July 2011, the FDA issued a draft instructive document on medical applications. In July 2012, the Food and Drug Administration Safety and Innovation Act (FDASIA) was signed into law to finalize the FDA's duties in supervising medical applications. In September 2013 and February 2015, the FDA issued and revised a draft guidance document for regulation over mobile medical applications, which fleshed out regulatory measures for mobile healthcare.

• Information security and privacy protection: The Health Insurance Portability and Accountability Act (HIPAA) and the Health Information Technology for Economic and Clinical Health (HITECH) Act, both of which were adopted in 1996, classified 18 types of information as private, defined in detail the digitization of health information, and developed corresponding rules for penalties and corrective actions.

• Health insurance reimbursement: So far, 29 states in the United States have enacted tele-healthcare bills, and the federal government and 48 states have developed online healthcare compensation programs that guide insurance companies to include tele-healthcare services into their reimbursement package.

• Technology application: In line with the principle of medical device regulation, wearable devices and mobile applications are managed under three categories. The strictest rule applies to those devices and applications that have a direct bearing on lives.

• Doctor qualification review: Enhanced management of registration and identity confirmation ensures doctor qualifications for the "Internet + Healthcare" model.

• Value-oriented services: The Affordable Care Act enacted in 2010 by then President Obama expanded the scope and coverage of medical insurance reimbursement targeted at Online healthcare services.

• Online healthcare policy relaxation: In May 2017, Texas became the last state in the United States to scrap the requirement that primary medical examinations must not be conducted remotely, creating a relaxed environment for online healthcare to grow in the country.

● Europe

Compared with the United States, the online healthcare development in Europe varies from country to country depending on unique national conditions and market environments. The mHealth App Developer Economics program, the biggest digital health market research program, examines 26 market indicators of the European Online healthcare market on five dimensions including ehealth adoption, digitization, market size and health expenditure, entrepreneurship

environment, and online healthcare regulatory framework. Some findings are listed below:

• Most EU member states have not yet started to use Internet health companies as a tool to attract top medical talents, improve healthcare outcomes, and reduce healthcare costs, not to mention clear roadmaps for the development for Online healthcare

• In the UK, Sweden, Denmark, and the Netherlands, doctors' acceptance of medical apps and a high level of digitization are considered to be the driving forces in building a favorable market environment. As shown in Figure 3-5, 55% of Online healthcare practitioners note that the UK offers the best market environment for doing Online healthcare business, followed by Germany (41%), Sweden (23%), Netherland (23%) and Denmark (18%). Germany is considered attractive because of its market size and huge number of potential users.

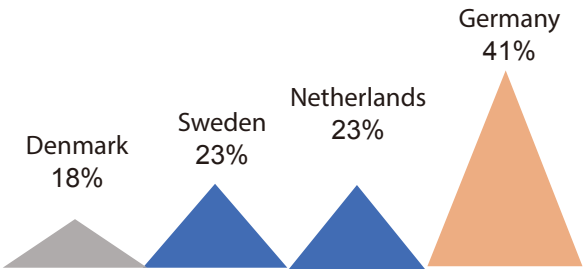

Figure 3-5 Country's feedback on the market environment for online healthcare business

• Denmark, Finland, the Netherlands, Sweden and the UK provide the best market conditions for online healthcare companies in the European Union. These countries score high in the market readiness assessment, which has been confirmed by practitioners.

• As there is no reimbursement for online healthcare services in EU countries, this ranking only reflects the local doctors' openness to new technologies, rather than demonstrating the excellence of these online healthcare business models.

In summary, the online healthcare development in Europe still enjoys huge potentials and a lot of issues remain to be explored.

China

Figure 3-6 The online healthcare market size and growth rate in China, 2012-2018

In China, Online healthcare represents a new trend in the health sector. It is conducive to resolving the conflicts arising from imbalanced distribution of medical resources across the country and the increasing demand for health care. Therefore, China's public health regulators at all levels are actively pushing for this healthcare model. For the two decades from January 1999 to February 2020, China's regulators have released more than ten policies on online healthcare, which has strongly boosted its development in the country. As of 2018, the online healthcare market size in the country had reached RMB 49.1 billion, a year-on-year increase of 51.08% (See Figure 3-6).

In the meanwhile, online healthcare business in China has developed into seven major areas, i.e. Internet hospitals, online consultation, online doctor service, pharmaceutical e-commerce, AI healthcare, aesthetic medicine, and health apps.

• Internet hospitals. They are mainly composed of Internet companies, IT service providers, governments and medical institutions. Multi-stakeholder cooperation is the mainstream model for Internet hospitals. Take WeDoctor as an example. With the WeDoctor Internet hospital platform at the core, it has shaped an integrated service model by connecting many platforms respectively focused on tiered diagnosis and treatment, general doctor services and prescription sharing to provide patients with online medical services such as online outpatient services, remote consultations, general-specialist referrals, health checkups, chronic disease management, and definitive appointment.

• Online consultation. Take Chunyu Doctor as an example. It is an online telemedicine platform with the "Chunyu Doctor APP" as the core, which builds an effective connection between patients with platform

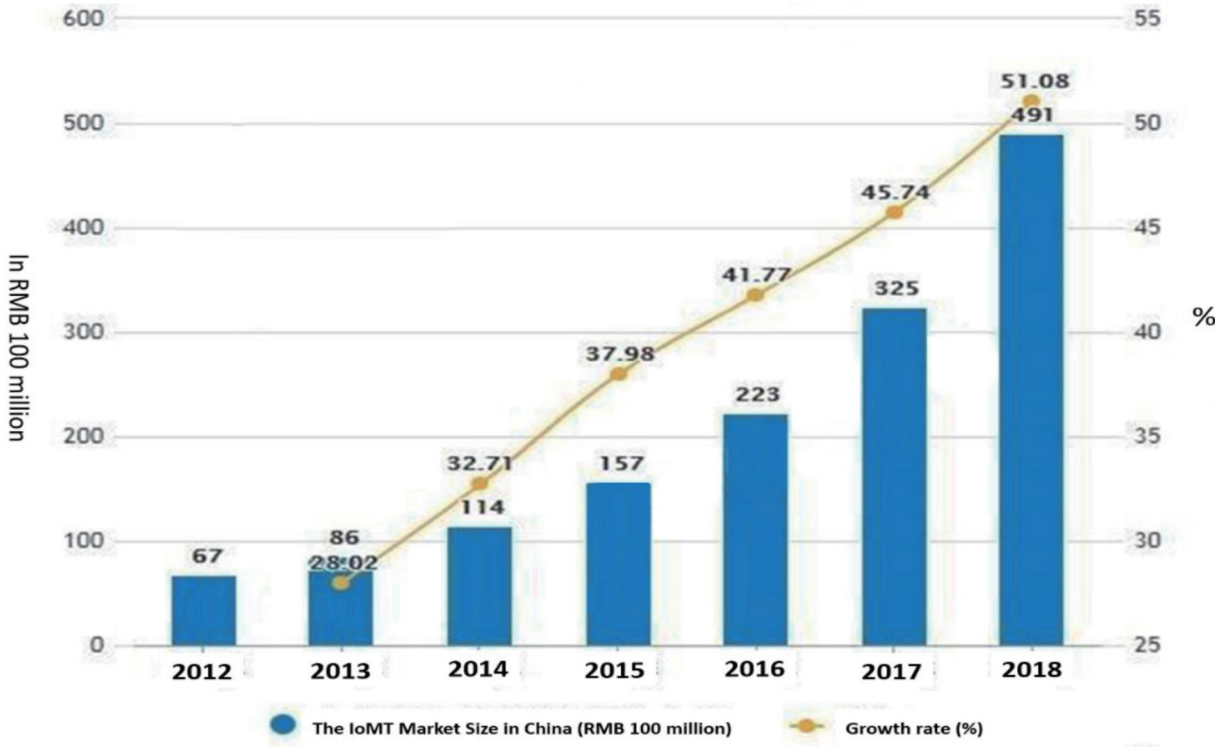

Figure 3-6 The online healthcare market size and growth rate in China, 2012-2018

data and resources relevant to medicine, hospitals, doctors and insurance. It provides users with a full range of online/offline services from pre-diagnosis consultation and in-diagnosis information services, to post-diagnosis patient management and health insurance.

· Online doctor service. Let us look at the case of Medlinker. As a real-name platform, Medlinker has collected 150,000 medical cases and 550,000 verified doctors, covering 31 provinces (municipalities and autonomous regions), 48 hospital departments and 25,000 hospitals in China. It provides academic, professional and social networking services to doctors.

· Pharmaceutical e-commerce market. In the case of yao.tmall.com, Tmall's online pharmacy marketplace, the Alibaba Group takes advantage of its platform and huge user traffic to integrate the pharmaceutical supply chain and connect physical hospitals, Internet hospitals, pharmaceutical companies, B2B manufacturers and third-party platforms. The platform champions a mixed business model of B2C, O2O and retail pharmacies, creates a new medicine circulation model of "manufacturer-pharmacy-hospital-consumer" and builds an online/offline business loop of pharmaceuticals circulation.

· AI healthcare market. There are eight key areas, i.e. virtual assistants, medical imaging, aided tools for diagnosis and treatment, disease risk prediction, drug discovery, health management, hospital management, and auxiliary medical research platforms. Among them, medical imaging and disease risk management are the most popular trends in the market.

· Internet aesthetic medicine. The Internet aesthetic medicine market in China is still at a growth stage with a focus on user accumulation and education. There are now vertical and comprehensive e-commerce platforms in this field. Vertical platforms are represented by SoYoung.com, Gengmei and Yuemei that target segmented customers or prospective users. They help medical cosmetology organizations to win customers and promote products. Comprehensive platforms including Meituan, Alibaba and DianPing create new opportunities for the internet medical beauty market with a focus on the light medical beauty.

· Health Apps. Take Meiyou, the first Chinese women's health app with over 100 million users, as an example. It has created a business ecosystem with "tools", "communities" and "e-commerce", targeting the age group of 20-39 and providing services such as menstruation tracking, pregnancy, community exchang es, and online shopping. It delivers a sense of physical safety, social networking, learning and belonging to its female users.

In general, driven by the growing market demand and strong support of national policies, the Internet medical industry has grown rapidly in China, which is reflected in the continuously improved data and services, emergence of unicorns in market segments and steady market growth year on year. As of April 2019, the number of online healthcare service users in China had reached 450 million, accounting for 52.9% of the total Internet users in the country.

3.3.3 Opportunities and Challenges facing the online healthcare

The online healthcare offers the benefit of efficiently integrating and redistributing available medical resources including doctors, patients, checkup facilities, wards, pharmacies, care and rehabilitation facilities, bringing a "positive" impact on patients, hospitals and doctors, as shown in Figure 3-7.

Patients	Hospitals	Doctors
• Reduced time and costs • Reduced travel costs • Reduced medical expenses	• Reduced medical costs • Improved management of chronic diseases • Shortened waiting time • Shortened hospital stay	• Higher productivity • More patients • Increased income

Figure 3-7 The "positive" impact of online healthcare on patients, hospitals and doctors

However, online healthcare, which combines information technology with medical technology, still faces four challenges as follows:

- **Challenges to regulators**

Online healthcare poses challenges to regulators in terms of standard development, resource allocation and operation supervision. Specifically, regulators shall help build capacity of online healthcare agencies for comprehensive health management based on qualification evaluation, operating standards and evaluation systems. They shall also establish an effective mechanism to ensure rights, responsibilities and interests of medical institutions, medical data analysis providers, wearable device data collectors and patients. Regulators must set up a patient privacy protection system to regulate sources of information, information storage, and data usage throughout the diagnosis and treatment process.

- **Challenges to business models**

The online healthcare industry was born at the intersection between the traditional medical industry" and "mobile Internet". Not merely a literal combination of "medical" and "Internet", it is redefining

and transforming medical services with the Internet thinking. The online healthcare business model has attributes of both health care and the Internet. It must reflect both the Internet thinking and the service spirit of the health sector. Due to a superficial conception of the Internet and ingrained knowledge of the social value of medical services, patients are generally unwilling to pay for online healthcare, and the market tends to be more sensitive and cautious about commercial Internet medical applications. The development of business models is a direct challenge in the online healthcare sector, which requires further integration between connectivity and healthcare.

- **Challenges to human resources of the medical system and the system itselff**

The online healthcare sector requires a large number of family doctors or general practitioners. They can complement and reinforce each other. As a key link between online and offline platforms, family doctors can accelerate the referral efficiency of online healthcare services. At the same time, their cooperation can effectively improve efficiency and quality of medical services, solve the problem of uneven distribution of medical resources, and reduce medical costs.

- **Challenges to medical data sharing and protection**

At the information age, if a data collaboration system is established between hospitals to share cases and diagnosis, it will undoubtedly help improve diagnosis efficiency and healthcare delivery of hospitals. Online medical data sharing is not simply data integration. Instead it means the need to achieve interoperability of medical information and connectivity of information among different hospitals by addressing the issues of service standards, information security, transmission standards, syntax and semantics.

In addition, personal medical data protection has been the focus of the sector since its inception. In the online healthcare model, patients provide personal information to the Internet medical platform, which transfers it to the medical institution. After diagnosis by doctors, the personal information is fed back to the patient through the same platform. Therefore, the risk of information leakage increases with the addition of data transfer links. In the meantime, personal medical information is often stored on diverse platforms and electronic data are more likely to be copied and disclosed, making it more difficult to protect information.

3.3.4 Inspiring perspectives from the session on the Online healthcare

- With the development of smart hospitals, it becomes important to ensure collaboration among hospitals. In the future, data silos will be turned into central and integrated database, and an integrated platform for hospitals will take shape to ensure the availability of patient data for the entire process. Previously stationary medical services will also go mobile.

- EHealth card plays a big role in tiered diagnosis and treatment by providing data for medical detection. When the patient enters another medical institution, his or her historical record will be presented to the next doctor, which is conducive to data flow within a collaborative medical system.

- We look forward to introducing new technologies. By turning big data, cloud computing and artificial intelligence into clinical insights, we can contribute to the development of clinical medicine, help hospitals make more sophisticated decisions and finally apply

big data in decision-making and policy development of the national health system.

· The key mission of "Internet + Healthcare" is to help address three issues: medical equality, medical equity, and healthcare freedom. Healthcare is a basic need of everyone. "Internet + Healthcare" is ubiquitous in our daily life and available anytime and anywhere. How to achieve resource sharing, how to make information reliable and how to increase people's health literacy are important topics to be answered by the health industry and medical professionals in the Internet era.

· It is recommended that an online healthcare research institution should be set up to delve into new models, activities and challenges, inform the policy-making of the governments and provide intellectual support for the businesses, as part of the efforts to promote the healthy development of the online healthcare.

Chapter 4
Health in All Policies

4.1 Overview

HiAP, or Health in All Policies, is an approach to public policies across sectors that systematically takes into account the health implications of decisions, seeks synergies, and avoids harmful health impacts in order to improve population health and health equity. It includes an emphasis on the consequences of public policies on health systems, determinants of health and well-being. It improves accountability of policymakers for health impacts at all levels of policy-making[10]. In practice, health impact assessment is a major tool and inter-sectoral collaboration is a key method, with the health perspective integrated throughout public policies.

A growing body of research suggests that health is shaped by many powerful forces. Our greatest health challenges are often linked through the circumstances in which people are born, grow, live, work and age, and the wider set of forces and systems affecting these circumstances, referred to as social determinants of health. These include: early years' experiences, education, economic status, housing and environment, and social norms[11]. According to WHO's data, 23% of all global deaths are linked to the environment. That's roughly 12.6 million deaths a year[12]. Annually, safe water supplies could prevent nearly 3 million deaths and protect 5 million people from being incapacitated[13]. There are 170 million children in poor countries globally who are underweight, and 3 million of them die each year as a result[14] .In recent years, due to demographic and climate changes and the urbanization and globalization processes, the impact of social determinants on health and health equity has been further enhanced.

In this context, promoting healthy communities, and in particular health equity across different population groups, requires that we address the social determinants of health. Collaboration is needed within many sectors, because the determinants of health have origins that extend beyond the direct influence of the health sector and

10 : [The Helsinki Statement on Health in All Policies, WHO, 2013.]

11 : [The Rio Political Declaration on Social Determinants of Health, WHO, 2011; and WHO's "What you need to know about Health in All Policies".]

12 : ["Environmental impacts on health", WHO.]

13 : ["How does safe water impact global health?", WHO. https://www.who.int/features/qa/70/en/.]

14 : [The World Health Report 2002: Reducing Risks, Promoting Healthy Life, WHO, 2002.]

health policies. But public health outcomes do not automatically gain precedence over other policy objectives in public policy-making as affected by business interests and market power. This requires innovative solutions, and structures that build channels for dialogue and decision-making and manage conflicts of interest transparently, to work across traditional government policy siloes and ensure that health and health equity considerations are taken into account in policy-making[15]. Building on such recognition, the concept of HiAP then emerged.

The Alma-Ata Declaration of 1978 stated that the attainment of health goals was dependent on the engagement of other social and economic sectors than merely the health sector, which paved the way for the development of the HiAP initiative. The Ottawa Charter of 1986 called for "building healthy public policy", highlighting the impacts of public policy on health. When Finland held the European Union presidency in 2016, the HiAP approach was officially presented, and made an essential principle for the EU's policy-making. It has been reinforced following the publication of the Adelaide Statement on Health in All Policies, the Rio Political Declaration on Social Determinants of Health, and the United Nations General Assembly's Resolution on the Prevention and Control of Non-communicable Diseases. In 2013, the Eighth International Conference on Health Promotion chose HiAP as its theme and adopted the Helsinki Statement that gave a clear definition of HiAP, which later guided the drafting of development agenda in many countries[16]. As the number of related international instruments and national policies continues to rise, a global HiAP network has gradually taken shape and the practices of HiAP have spread rapidly across the world. From a global perspective, while it has been widely implemented and applied toward maturity in Australia, Finland, Thailand, the United States, and New Zealand, initial attempts and explorations of HiAP are underway in China, Canada, the United Kingdom, and Sudan[17]. In general, HiAP initiatives can take five forms (See Figure 4-1) to coordinate and promote cross-sector strategies for achieving health goals: (1) initiated by health authorities, with a focus on improving health and health equity, which is the most common form; (2) initiated by heads of state, with a focus on solving a health issue, which is often seen in public health

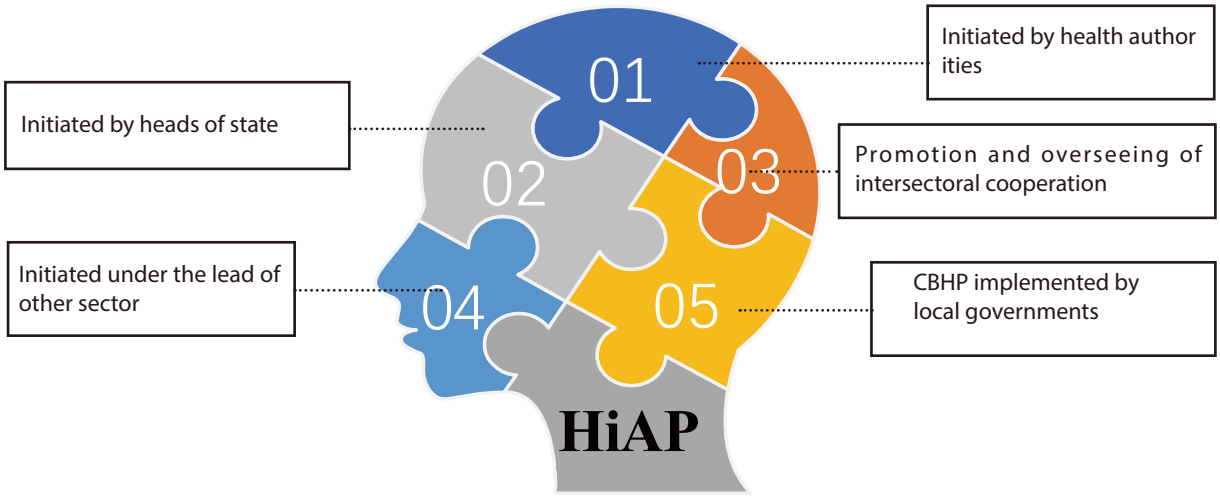

Figure 4-1 HiAP's five forms

15 : ["What you need to know about Health in All Policies", WHO.]

16 : [Health in All Policies (HiAP) Framework for Country Action, WHO, 2013.]

17 : [Progressing the Sustainable Development Goals through Health in All Policies: Case studies from around the world, WHO, 2017.]

emergencies; (3) established new institutions or use existing ones to promote and oversee the inter-sectoral cooperation, with a focus on addressing public health priorities; (4) initiated under the lead of other sector authorities, which is commonly seen in road traffic injuries (RTIs) prevention, responses to environmental hazards, etc.; and (5) initiated at the local level of government, through community-based health promotion (CBHP) programmes.

Looking forward, HiAP will contribute to the further integration of more health risk factors into policy making, creating larger opportunities for the improvement of health and health equity.

4.2 Session Highlights

4.2.1 The Development of the Medical Talents and Healthy China Strategy

Medical talents are the main force to implement the Healthy China strategy. The major problem with Chinese clinicians has now shifted from insufficient quantity to low quality and poor structure. In addition, the development of medical talents calls for better policies and improved mechanisms. Apart from policy support, social capital and non-governmental participation in medical care are also playing an increasingly important role. Strengthening medical personnel training and bringing the role of non-governmental medical care into full play are crucial for the realization of the Outline of Healthy China 2030 Plan. On the afternoon of June 10, 2019, a session for the Development of the Medical Talents and Healthcare Industry was held to discuss these issues.

- **Use solid incentives and deepened medical education to solve the quantity, quality and structure problems with China's medical workers**

China is faced with a lot of problems as far as clinicians are concerned. The number of doctors per thousand population is low and the contradiction between supply and demand is prominent. Clinicians typically have a less-than-good educational background and fall short of qualifications. Rural areas and less-developed regions have great difficulty in acquiring qualified medical workers. And there is also a universal shortage of general practitioners, pediatricians, psychiatrists, gynecologists and obstetricians. To improve the situation, we should continue to pursue the 5+3+X lifelong learning system and take targeted measures. To fix the problems of quantity and structure, medical colleges and medical institutions must coordinate their efforts so that medical personnel training can well meet the demand in terms of the number and the job position and that enrolment should be based on employment needs and roles to strike a good balance between supply and demand of medical workers. To increase the appeal of medical positions, especially the ones that urgently need to be filled, there should be solid incentives and strong supervision over their implementation. In order to produce more qualified medical workers, medical colleges must first of all enroll students of better quality. Then, they should strengthen students' professional skills to ensure their competence upon graduation. Efforts must also be made to establish training bases and build strong faculty teams to provide medical talents with continuing education after their graduation.

- **Build a strong team of general practitioners and push for hierarchical medical model**

The key to China's medical reform lies in the establishment of a referral system and a hierarchical

medical model, and the key to the establishment of a referral system is building a strong team of general practitioners and raising the level of primary care. As far as the development of general practitioners is concerned, attention must be paid to both quantity and quality. There should be more incentives and better policies to increase the attraction of the job, so that general practitioners on one hand can enjoy a higher social status, have a greater sense of achievement and feel prouder of their profession and on the other hand have brighter career prospects. When it comes to capacity building, the "5+3" model that combines college education with continuing education has proved to be successful. General practitioners are expected to acquire six core competencies, have a down-to-earth attitude and be committed to providing primary medical care.

The training of general practitioners and the establishment of hierarchical medical model are complementary to each other. Hierarchical medical model can address the problem of structure with China's medical workforce. We must push for hierarchical medical model and vigorously carry out institutional positioning of the primary care for chronic diseases, common diseases, and frequently occurring diseases so medical talents can stay committed to primary care.

- **Talent export of public hospitals provides a means for workforce development in private medical institutions**

Talent export of public hospitals provides a new means for workforce development in private medical institutions. We should ensure the autonomy of medical and health institutions in employing people, fully implement contract-based employment, and actively explore the possibilities of allowing doctors to practice medicine as freelancers. In the future, more and more doctors will become freelancers instead of working for state-owned institutions. They will serve under contracts signed with medical institutions including private medical service providers or form medical groups to serve the general public from various perspectives and on various levels.

4.2.2 Rebuilding Lives Living with Disabilities: Rehabilitation University

According to statistics, there are one billion physically challenged people in the world. In China there are 85 million physically challenged people, plus 44 million disabled or semi-disabled elderly people. Building rehabilitation universities is an active way to cultivate rehabilitation talents and help those living with disabilities. It is a great choice that allows us to move in the direction of integral development of disease prevention, medical treatment and rehabilitation and to provide all-round life-cycle health services for human beings. The Chinese government has explicitly revealed its plan to build a rehabilitation university that will be located in the city of Qingdao. However, rehabilitation does not have obvious disciplinary advantages at present. Talent development, scientific research and conversion of research results related to rehabilitation are still in its infancy, calling for insights and support from multiple sources. To address this challenge, the first conference of the Global Health Forum held a session on Rebuilding Lives Living with Disabilities (Rehabilitation University) on the afternoon of June 11, 2019.

- **Value all-round recovery (physical, mental, and social functioning) and make prevention the first line of defense in rehabilitation**

Rehabilitation is not just physical recovery. It also means mental recovery and recovery of social functioning. There are clinical cases of mental disorder resulting from physical disability, and there are also cases of disability among patients with mental disorders. Therefore, we must emphasize the importance of mental rehabilitation to a person's physical rehabilitation. As far as social functioning is concerned, it is crucial to provide humanistic care. Therefore, a rehabilitation university must first of all teach students the full meaning of rehabilitation and at the same time cultivate their ability to help disabled people with their self design. With positive self design, the disabled will be able to turn themselves into contributors to society rather than dependents.

Furthermore, prevention and rehabilitation complement each other. The best result of rehabilitation is to achieve better prevention through a better understanding of the process. Therefore, a rehabilitation university should include prevention in their curriculum and develop it into a characteristic discipline. Its focus should be on building a research system to find out what kind of diseases may lead to congenital or acquired disabilities, why, and whether there is a way to prevent them from happening. In this way, rehabilitation can start from the source.

- **Build a phased training and certification system, cultivate interdisciplinary talent and bring into play the roles of both traditional Chinese medicine and modern science**

A rehabilitation university should extend its talent training to cover multiple fields such as medicine, social humanities and bioengineering so as to prepare for the birth of a new-type of rehabilitation university. The biggest challenge is to integrate rehabilitation training with other knowledge, technologies and courses. The best solution is to establish a phased training and certification system, carrying out postgraduate programs to produce rehabilitation physicians with professional titles and enrolling undergraduate students in medicine, engineering and other basic subjects.

The Outline of Healthy China 2030 Plan emphasizes the dominant role of traditional Chinese medicine in rehabilitation. To develop rehabilitation medicine, a rehabilitation university must attach great importance to the know-how applied in traditional Chinese medicine. They must exhibit Chinese characteristics by integrating traditional Chinese medicine into their teaching system. In addition, with the progress of science and technology, rehabilitation courses should be combined with big data and artificial intelligence, and close attention must be paid to the developments of cutting-edge science, such as stem cell therapy and gene therapy, to achieve modern rehabilitation.

- **Define demand according to the posts to be filled and implement talent training according to demand**

A big problem is that we are producing rehabilitation talents who don't actually go to work at the grassroots level where they are most needed. This means that it is not enough to cultivate high-level rehabilitation talents who can meet international standards and that it is equally important to target local demands. Therefore, from the very beginning, disciplinary development in rehabilitation universities should be post-oriented and development planning for students should be employment-oriented, taking into full consideration the issue of professional qualification accreditation upon graduation. The purpose is to make sure graduates are well received and medical positions are adequately filled.

- **Build a rehabilitation IoT system, strengthen the value chain of rehabilitation medicine and boost doctors' professional identity**

Rehabilitation medicine enjoys no obvious advantages over clinical medicine, so it becomes particularly important for rehabilitation universities to have their unique characteristics. With the IoT and big data technologies, rehabilitation universities, hospitals, communities, families and enterprises can combine efforts to form a strong rehabilitation IoT system. On one hand, rehabilitation medicine can build its value chain by linking the capital chain, talent chain, and industry chain. On the other hand, rehabilitation effort must be people-oriented, warm and sympathetic, taking people's needs and feelings into full consideration. In addition, institutional development should be focused on improving rehabilitation professionals' identity and social status so that more talents will come to work in this field.

- **Develop innovative products and facilitate tech-enabled rehabilitation**

Rehabilitation universities should lay emphasis on the role of technology in product R&D. They should establish solid mechanisms and systems in order to achieve a good integration between industry, education and research, and between medical treatment, rehabilitation and health maintenance. Their product development should reflect wisdom pooled from different disciplines, be driven by market demand, conform to the procedures and cost-benefit requirements, and meet the purpose of clinical care and rehabilitation. Rehabilitation universities should also nurture a culture of scientific innovation and create a relaxed environment that tolerates mistakes.

4.2.3 Planetary Health

Planetary health refers to the earth's ability to provide a healthy living environment for human beings and all other living things in 2050. This is also an important part of the United Nations Sustainable Development Goals. However, with the progress of urbanization and industrialization, while making great economic achievements, we have also caused degradation of ecosystems and loss of biodiversity, which have led to many global health problems. For this reason, the world must explore comprehensive and effective policies to protect the health of the planet.

- **Encourage information exchange between different fields to inspire new ideas**

To maintain planetary health, information exchange and communication between different sectors, different fields, and different disciplines is very important. Information exchange platforms should be established so that we can share technology and experience. Answers must be found to the question of what can make us healthier so various stakeholders can coordinate their efforts and maximize the impact. In addition, cross-border and cross-regional knowledge transfer allows developing countries to consider more possibilities in decision-making and avoid repeating their mistakes of the past. However, in carrying out the plan, we must not only have a global perspective but also gain insights into the local situation and identify unique problems of each community.

- **Promote scientific research to inform policymaking**

Scientific research plays a vital role in assessing

and solving global environmental problems and promoting harmonious coexistence between man and nature. On one hand, research allows us to know the boundaries that are not to be crossed if we want to maintain planetary health. For instance, by collecting data, establishing models, and conducting economic analysis, we can find the threshold for safe operation of the bodies of water, thereby maintaining their health within the threshold. On the other hand, maintaining planetary health requires concerted efforts from different levels and different domains. By strengthening the computing power and adopting new research paradigms, we can pinpoint the impact of various interwoven environmental factors on the health of our earth and work out systematic solutions to the complex challenges.

- **Build a phased talent training system for planetary health**

When it comes to training talents for planetary health, current medical education is mainly at the undergraduate level. And it is no easy job to require that the students immediately take a pluralistic and inclusive view about the planet. An ideal way to cope with the challenging situation is to make sure that the undergraduate curriculum leaves some space for students to explore diversified knowledge and develop multidimensional thinking, and that the postgraduate curriculum equips the students with a clear direction, a unique perspective and a brave experimental mindset. In this respect, Tsinghua University and Peking Union Medical College Hospital have set a very good example with their joint training program, which allows students to acquire a medical degree after completing their study of geochemistry and geophysics. This is the future direction of talent cultivation for the well-being of the earth.

- **Prioritize planetary health and solve conflicts of interest by rebuilding values**

Planetary health would be impossible without concerted efforts from various sectors. However, it is never easy for different sectors with different priorities to reach an agreement. They need to strike a balance through communication and coordination. The best way to resolve competing objectives between different sectors is to encourage governments, communities and individuals to reduce their desires and let their behaviors guided by their basic needs rather than by their greedy desires. We need to show more concern about our environment and earth. Young students are the future of our world, so it is extremely important for professionals to take action and change their values.

4.2.4 Urban Development

Urbanization is the general trend in today's world. It brings better education, higher household income and brighter job prospects. Naturally people are having higher and higher expectations of urban life and start to think more and more about the concept of healthy city. Building a healthy city means providing good conditions for every resident so they can live a healthy, secure and fulfilling life. This is also one of the UN Sustainable Development Goals. A big challenge we face today is to integrate the concept of healthy city into all related policies and put people first in urban planning to harvest both environmental and health benefits. On the morning of June 12, 2019, participants of the session on Urban Development shared innovative perspectives on the issue.

- **Build high-level leadership to push for policy integration**

To create a healthy city, education, environmental protection, finance, public transportation and other sectors must cooperate with each other. It requires high-level leadership to achieve multi-sectoral collaboration and policy integration. In Singapore, health policies are advanced through national initiatives designed in a top-down approach. After the Prime Minister's Office issues a policy initiative, ministries and commissions will work together to push for its implementation. In China, after the "Healthy China" initiative became a national strategy, the Health Assembly has received strong commitment from top leadership, which is convened by the President and attended by provincial governors and party secretaries. This model is designed to mobilize all resources and forces available to include Health in All Policies, thus realizing the institutional innovation driven by public health policies.

- **Empower people and encourage participation by all and for all**

Universal participation in urban development means that people should be empowered and communities and other stakeholders should be represented so that all can be engaged in policy making. And the key to universal participation is universal education. By spreading knowledge about healthy cities among the public, who are at different intellectual and cognitive levels, we can increase public awareness of urban development and boost public participation. Educating the youth is particularly important, because all policies are developed for the future. We must encourage the next generation to shape a personal vision of their city in the future and develop new values, in a joint effort to build healthy cities by attaching equal importance to health and wealth.

As far as benefits sharing is concerned, community-based service delivery is the key to comprehensive health care. The development of a healthy city should be inclusive of people from different economic backgrounds, origins, and genders. At the same time, in the process of urbanization, the needs of those living in rural areas must not be overlooked.

- **Build a smart lifestyle by integrating hardware, software and people**

To build a smart city, we must first of all have good hardware, which requires collaborative planning of science, medicine and other related communities in delivering an integrated high-level design that addresses the needs of future health. On the other hand, we must build a strong software system, where the latest science and technology can be applied in the development of healthy cities. For example, open sharing and statistical analysis of scientific data on national population and health can teach us what kinds of weather tend to cause diseases, and then various kinds of communication devices can provide us with health forecasts. Finally, we have to consider the human aspect. We must educate the public on health, help them with environmental adaptation and promote harmonious coexistence so that we can get closer and closer to "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO).

4.2.5 NCD Risk Factors

Everywhere in the world, smoking, alcohol consumption, high-sugar, high-salt diets, insufficient fruit intake, and inadequate exercise are among the risk factors causing chronic non-communicable diseases, thus affecting people's health. The blame should not be put on the individuals alone. There are also social, political and commercial reasons. Therefore, it is imperative to

explore how governments and various communities can combine their efforts and integrate health policies to handle these risk factors and prevent chronic NCDs from occurring, progressing and spreading. On the afternoon of June 12, 2019, a session on NCD Risk Factors was held as scheduled, where experts from different countries exchanged ideas on this topic.

- **Strengthen political leadership to propel multi-sectoral collaboration**

Political will and policy promotion at the leadership level are particularly important. To address those pending health problems, the government must deepen its understanding of the situation and take creative actions to ensure real implementation and continuity of health policies. Confident, action-oriented and consistent leadership is the very foundation for unswerving implementation of health policies.

Work achievements should be largely attributed to multi-sectoral collaboration. For example, in Hong Kong, China, information acquired by monitoring the unhealthy behaviors allows the government to move in the right direction; health education programs are carried out to spread knowledge about health and promote healthy lifestyles; cooperation between enterprises results in healthy food products. In Shandong, China, the Ministry of Health works hand in hand with the Ministry of Finance, the food sector, the market supervision authorities and the Womens Federation to encourage consumption of low-sodium salt and popularize knowledge about iodized salt. They have effectively reached their goal of cutting salt intake and have stood out as a success story in public health policy.

- **Address societal determinants of health to promote health justice**

Some societal determinants of health are closely related to our daily life, such as smoking, alcohol use, and eating habits. Other determinants are structural factors, such as public environment and government policies. Therefore, change of behaviors, environments and policies are all very important in dealing with chronic non-communicable diseases. In addition, health inequities are another focus of attention. In China, rural residents, people in western regions, and low-income and under-educated populations generally have poorer health status. Therefore, it is essential to overcome health inequities through poverty relief and investment.

- **Raise public awareness of the risk factors and change the alcohol culture**

Alcohol consumption is closely related to culture. On one hand, people have an inherent way of understanding alcohol use; on the other hand, the wine industry keeps promoting alcohol consumption by influencing public perception via refined product designs, which are targeted to the needs of specific groups, and various promotion activities like obtaining the naming rights, sponsoring big events and advertising on the new digital platforms. Therefore, it is imperative for the government to help the public realize the damaging effect of alcohol on our health. Meanwhile, international and national organizations should formulate a policy that is similar to WHO Framework Convention on Tobacco Control for the purpose of globally reversing the alcohol culture and reducing the harm of alcohol.

- **Adjust market investments to create a healthy consumer market**

Commercial determinants of health matter a lot in the treatment of chronic NCDs, because non-health-oriented industries, such as tobacco and food processing, promise huge economic benefits. They have attracted a large amount of irresponsible investment leading to harmful consumption. And the special nature of such industries makes it difficult to find a solution. On one hand, these products have global markets and are very inviting to stakeholders from various domains, which means it is far from enough to cooperate with a single company or implement a regional policy. On the other hand, these industries are the guarantee of some social benefits, especially in developing countries. For instance, many tobacco companies invest hugely in pension programs, so we find ourselves in an awkward situation where we have to keep pouring money into the money-spinning tobacco company in order to finally get our pensions.

Therefore, we should take active measures to adjust our investment and guide capital flows so as to advance the consumer market in a healthier and more reasonable direction. First of all, we should use the instruments of national legislations and international agreements to impose extensive restrictions on market and exercise strong supervision so that those enterprises are willing to make money while safeguarding people's health. Secondly, we must work hand in hand with the World Bank, insurance companies and pension systems all over the world to improve the structure of social welfare programs and prevent passive investment in industries that are damaging our health.

- **Boost health-promoting industries such as sports**

Assessment on health progress of patients with chronic NCDs and investment returns shows that investment in health and healthcare industries will bring not only health improvement but also economic gains. As exercise can improve people's physical quality and enhance people's physical and mental well-being, the sports industry has become especially favored by health investors. Since mass sports have huge potentials in driving consumption but sports facilities are falling short, some companies have started to provide small but beautiful sport venues where people can receive professional guidance. While helping people to do sports in a fairly safe and professional way, the enterprises can witness their own sports venues, sports population and sports consumption growing and their own exercise habits improving step by step.

4.2.6 Antimicrobial Resistance

Antibiotics have saved millions of lives and prolonged our lifespan by twenty years. However, microbial mutation has weakened the effectiveness of antimicrobials and may have put tens of millions of people into disease and poverty. Antimicrobial resistance not just affects human beings. It also affects animals, plants and marine products. What's more, the antibiotic pollutants discharged by pharmaceutical companies and hospitals may be quietly passed into our body along the food chain. On the afternoon of June 12, 2019, a session on "Antimicrobial Resistance" was held to discuss how various sectors could work together to reduce antibiotic use.

- **Solve the antibiotic resistance crisis through national action programs**

The WHO has been urging every country to formulate a national action plan that involves multiple fields

including agriculture and environment. By building a framework of supervision over policy planning and policy evaluation, the WHO is trying hard to promote communication and collaboration between different countries and help them to work out better plans and goals. To address antimicrobial resistance, 75% of countries have already developed a national action plan.

China is the biggest producer and consumer of antibiotics. Making a national action plan is also China's way of dealing with antimicrobial resistance. In 2016, China issued an action plan on addressing drug resistance, which was backed up by 14 relevant ministries and commissions. So far, great progress has been made in public awareness and government action.

- **Develop an algorithm to improve diagnosis and prescription**

Humans are confronted with more and more complicated infections. To deal with antibiotic resistance, accurate clinical diagnosis and rational prescription are particularly important. We hope that an algorithm reflecting collective wisdom of multi-stakeholders can be developed to help clinicians prescribe drugs in a more rational manner. To this end, we should take regional differences into account and make it a point to assist and train local medical workers so they can fit into the local medical system. In the process, we can collect data on regional infection patterns and drug resistance through the regulatory system and inform the rational use of antibiotics.

- **Provide policy support for pharmaceutical innovation and R&D**

In terms of R&D, biopharmaceutical companies are now trying to solve the problem of antimicrobial resistance through drug development. The Global Health Drug Discovery Institute (GHDDI) is working hand in hand with the Bill & Melinda Gates Foundation and the Chinese Government in recruiting top experts and researchers, in an effort to develop innovative drugs through microorganism hunting, high-throughput screening and animal modeling and make them ready for clinical trials. However, the development of new drugs is very costly and time-consuming and the rate of failure is high. Also, the new drugs are not widely applicable and may be used only for epidemic outbreaks. As a result, pharmaceutical companies are often reluctant to produce new drugs. To improve the situation, the governments need to find out beforehand where innovation is a must and where support is needed, and then work out new mechanisms and new models to encourage the private sector to engage in drug development and innovation.

- **Promote intelligent animal husbandry to reduce diseases at the source**

Progress has been made in reducing the use of antibiotics to promote human health. Yet the situation is not so optimistic in industries like livestock and poultry raising. In China, more than 80,000 tons of antibiotics are used in livestock and poultry raising each year to reduce diseases and speed up growth, only resulting in compromised meat quality as well as environmental pollution. It has become an imperative to reduce or prohibit the use of antibiotics in this industry. A fundamental solution is to control the use at the source and promote the health of livestock with new farming models that depend less on antibiotics. Potential measures could include boosting pigs' immunity through a balanced diet; building an intelligent farming base with purified air and constant temperature and humidity so the animals can grow in a more comfortable, safer and cleaner environment; and implanting chips in domestic animals, when the conditions are ripe some day in the future, under the support of big data, to collect data on their body temperature and exercise level, and then predict and

analyze diseases for the purpose of reducing antibiotic use.

- **Strengthen health education to raise public awareness**

At present, most people know very little about drug resistance. When catching a cold, their first choice is still the use of antibiotics. To change the situation, the public health sector and pharmaceutical companies should take the responsibility of educating the public about drug resistance, teaching them how to use antibiotic properly and how to avoid infection through other means.

In addition, we must make the public familiar with the idea of paying for health. Reduced use of antibiotics in livestock provides us with healthier sources of food intake, but consumers need to be ready to pay more for healthier food. This is the crux of the matter. We should make the public realize that they either pay for food (health) or pay for drugs (illness). The two options form a closed loop. When people realize that the difference lies only in where they spend their money, they will make a wiser choice.

4.3 Special Case Study: Mental Health of Youth Requires Global Collective Action

Mental health is an important part of human health and well-being. Good mentality plays a positive role in helping individuals release their potential, cope with stress and increase productivity throughout his life cycle. Mentally healthy people also contribute to economic prosperity and social stability. Due to social and economic development and changing lifestyles, young people, as the backbone of society, often face various mental disorders that are likely to produce a serious lasting negative impact on their health. However, we are not paying enough attention to youth mental health, and mental health and psychological counseling services are lagging behind. To make matters worse, those with mental disorders are sometimes misunderstood and biased across the society. As a result, mental problems have gradually become a major obstacle hindering young people's health. This report is a comprehensive review of the current status of youth mental health, the main causes of the problems, and national and international measures taken to improve and promote mental health among young people. The purpose is to promote youth health and support the delivery of Universal Health Coverage and Health for All.

4.3.1 Current Status of Youth Mental Health

- **Definition of youth mental health**

Before exploring the current status of youth mental health, we should have a clear statement about its definition. The World Health Organization defines mental health as a state of well-being in which positive emotions and positive functioning are key factors. In other words, mental health does not merely mean the absence of disease or infirmity. Rather, it is a "state of well-being in which the individual realizes his or her own abilities, can cope with normal stresses of life, can work productively and fruitfully, and is able to contribute to his or her community[18]. However, due to social development, cultural progress, and changes in

mainstream values, such as different anticipations for the mental health conditions of minorities or other vulnerable groups in different social backgrounds, like homosexuals and refugees, the WHO's definition of mental health is not entirely applicable in measuring the mental health condition of today's young people. So some scholars are attempting to enrich the definition using more universal values. For example, Silvana extends the components of mental health to cover the following values: respect and care for oneself and other living beings; recognition of connectedness between people; respect for the environment; respect for one's own and others' freedom[19].

- **Major mental health problems for young people**

The mental health of young people is far from optimistic. Mental health problems are one of the major burdens of disease among young people worldwide. Globally, about one in five young persons suffer from mental disorders, and the incidence of mental health problem increases with age. Suicide is the second leading cause of deaths among young people worldwide. Affected by the conflicting environments, about one in nine young people have moderate or severe mental disorders20. Young people from different social, economic and cultural backgrounds

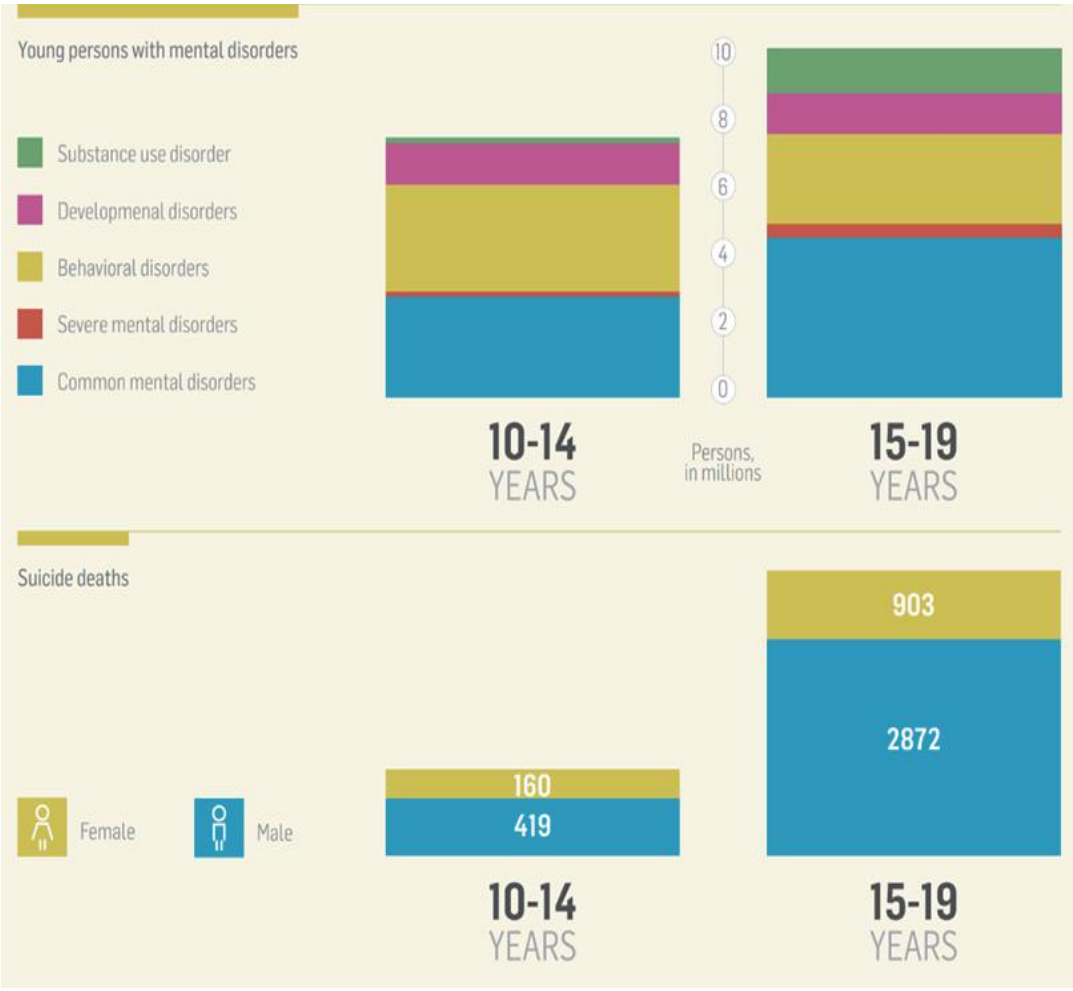

Figure 4-2 Distribution of young people with mental disorders in WHO European Region

face different mental health issues. In high-income countries and regions, although the younger generation is more satisfied with their present life than their parents once were with theirs, the incidences of depression and anxiety, suicide and self-harm, eating disorders, and psychoactive substance abuse among young groups have kept increasing in recent decades and have become the main threats faced by youth in European and American countries. The same is true with minority groups such as homosexuals[21].

Figure 4-2 shows the number of young persons with mental disorders in WHO European Region. In both the 10-14 and 15-19 age groups, adolescents with mental problems account for one fifth of the total number in the age group. Depression and anxiety are the biggest problems troubling young persons. About 20% have experienced symptoms of depression or anxiety. Depression and anxiety may affect young people's ability to establish and maintain social relationships, hurt their education and work performance, lower their income level and quality of life, and increase their risk of suicide[22], which is the second leading risk factor for deaths among young people[23]. About 7% -14% of young people have committed self-harm, and 20% -45% have considered suicide at one point or another. Most common causes for suicide among youngsters are family accident, history of mental illness or suicide in the family, their own mental illness, alcohol or drug abuse and so on. Causes for self-harm makes a longer list. In most cases, adolescents choose self-harm as a way to let off negative emotions. 1%-2% of young people suffer from eating disorders, struggling with either anorexia or hyperphagia. Without timely and effective intervention, eating disorders may easily lead to other mental and physical illness. Substance use disorders including drug abuse, alcohol abuse, tobacco abuse and drug abuse, are also common among young people in high-income countries. Similar to eating disorders, substance abuse can greatly increase the risk of self-harm, suicide, depression and other mental disorders. It also increases the risk of HIV acquisition and other physical diseases.

The global burden from major mental disorders is now mainly borne by low- and middle-income countries, where destabilizing factors like war, cultural conflict and natural disaster often exacerbate adolescents' mental health problem. Unfortunately, these low- and middle-income countries are not

18 : [World Health Organization, Promoting mental health: concepts, emerging evidence, practice: a report of the World Health Organization, Department of Mental Health and SubstanceAbuse in collaboration with the VictorianHealth Promotion Foundation and the University of Melbourne. 2005: World Health Organization. World Health Organization, Constitution of the world health organization. 1995.]

19: [Galderisi, S., et al., Toward a new definition of mental health. World Psychiatry, 2015. 14(2): p. 231-233.]

20: [World Health Organization, Ten facts on mental health. 2019.]

21: [Jurewicz, I., Mental health in young adults and adolescents–supporting general physiciansto provide holistic care. Clinical Medicine, 2015. 15(2): p. 151. Twenge, J.M., et al., Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005–2017. Journal of Abnormal Psychology, 2019. Russell, S.T. and J.N. Fish, Mental health in lesbian, gay, bisexual, and transgender (LGBT) youth.Annual review of clinical psychology, 2016. 12: p. 465-487.

22: [Beardslee, W.R., et al., Prevention of depression in at-risk adolescents: longer-term effects. JAMA psychiatry, 2013. 70 (11): p. 1161-1170. Gibb, S.J., D.M. Fergusson andL.J. Horwood, Burden of psychiatric disorder in young adulthood and life outcomes at age 30.The British Journal of Psychiatry, 2010. 197(2): p. 122-127.]

23: [World Health Organization, Mental health action plan 2013-2020. 2013]

paying enough attention to youth mental health and their research in this area is scarce. Besides having mental problems common to young persons in high-income countries, adolescents in low- and middle-income countries may be more afflicted by depression, alcohol abuse, self-harm, schizophrenia and bipolar affective disorder. Schizophrenia and bipolar affective disorder normally last long and are prone to recurrence, affecting the patients and their families in a more serious way[24]. There is some difference in the burden of mental illness between young males and young females in low- and middle-income countries. For example, incidence of alcohol abuse is higher among young males, but schizophrenia more frequently occur in young females[25].

- **Consequences of youth mental disorders**

Mental disorders not only have short-term and long-term effects on the health condition of the patients themselves, but also adversely affect their families and society. Young persons who have experienced mental disorders are more likely to suffer from the same or other mental illnesses, affecting the rest of their life. Therefore, it is vitally important to provide timely intervention while they are still young. Mental disorders like depression, anxiety, and schizophrenia may only be diagnosed late in life, but they actually started to develop when the individuals were still young. Providing intervention for adolescents at high risk of or at the early stage of mental disorders can effectively prevent the occurrence of mental diseases and disabilities later in life[26]. More importantly, youth is a period of life when people learn to position themselves and shoulder social responsibilities. Severe mental problems at this stage may lead to a lower level of education, reduced income or even unemployment. Poor social and economic status will not only hurt young people's own health, but also produce damaging effects on their next generation and other family members and thus increase social instability.

4.3.2 Key Factors Causing Mental Disorders among Young People

According to the social determinants of health, mental health of young people is influenced by both individual factors such as heredity, physical illness, emotional and behavioral adjustment ability, interpersonal relationship and communication, and social, cultural, economic, political, and environmental factors, such as national policies, social security measures, living and working conditions and community support. In high-income countries and regions, fast-paced social development, excessive social pressure, and unhealthy lifestyles are the main causes of mental health problems among young people. Many studies on the young people in developed countries suggest that social media may also have a negative impact on their mental health. Frequent use of social media not only reduces face-

24: [Alloh, F.T., et al., Mental Health in low-and middle income countries (LMICs): Going beyond the need for funding. Health Prospect, 2018. 17(1): p. 12-17.]

25: [Patel, V., Mental health in low-and middle-income countries. British Medical Bulletin, 2007. 81(1): p. 81-96.]

26: [Gustavson, K., et al., Prevalence and stability of mental disorders among young adults: findings from a longitudinal study. BMC psychiatry, 2018. 18(1): p. 65. O Connell, M.E., T. Boat and K.E. Warner, Preventing mental, emotional, and behavioral disorders amongyoung people: Progress and possibilities. Vol. 7. 2009: Washington, DC: National Academies Press. Patel, V., et al., Mental health of young people: a global public-health challenge. The Lancet,2007. 369(9569): p. 1302-1313]

to-face communication among young adults but also makes them more exposed to online public opinions and cyber violence, which will increase the likelihood of depression, self-harm and suicide [27].

In low- and middle-income countries and regions, more destabilizing factors lead to higher proportions of young people having mental health issues and more complicated situations. Poverty, social exclusion, trauma and displacement due to wars, cultural conflicts and disasters are all major causes of mental issues among young people in low- and middle-income countries and regions[28]. Factors such as low education levels, economic difficulties and debts, and failure to meet basic living standards in these countries and regions greatly increase young adults' risk of mental disorders. In addition, prejudice and discrimination against people with mental illnesses are also more common in low- and middle-income countries, which is not conducive to improving their mental condition. The causes of mental health problems among young men and women in low- and middle-income countries are also different. For example, domestic violence is the main cause of mental issues among young women in many low- and middle-income countries, while pressure arising from the society and family duties is the root cause of many young men's mental health problems.

In conclusion, many important structural or social factors are putting young people at risk of mental disorders, mental illnesses, and attempted suicides. These factors include poverty, immigration, gap between expectations and realities, early and forced marriages (usually adolescent girls), sexual violence and violence from intimate partners (usually adolescent girls), other risks (such as drinking and other substance abuse), unprotected sex (especially among boys), related homicides and social norms will all increase the likelihood of young people having mental health disorders.

4.3.3 Youth Mental Health Calls for Global Action

- **Coordinated efforts between families, communities and governments are required to tackle youth mental health challenges**

Mental health promotion and intervention measures aim to help young people regulate their emotions and build resilience towards difficult situations and adversities, and provide them with a supportive social environment and social network. It is particularly important for the healthcare and education sectors to do their job well. Families, teachers, communities and governments all need to take active measures to promote mental health among young people by building an open and healthy interactive relationship with them. To achieve such goals, we must apply multi-layered approaches, for instance, making good use of the digital media, healthcare or social facilities, and strategies specially designed for young people (especially the most vulnerable ones). Take the prevention of suicide as an example. At the macro level of structure and environment, the government, when implementing mental health policies, must also introduce policies on reducing the harmful use of alcohol, establish effective monitoring systems

27: [Lin, L.Y., et al., Association between social media use and depression among US young adults. Depression andanxiety, 2016. 33(4): p. 323-331. Robinson, J., et al., Social media and suicide prevention: a systematic review. Early intervention in psychiatry, 2016. 10(2): p. 103-121.]

28: [Patel, V. and A. Kleinman, Poverty and common mental disorders in developingcountries. Bulletin of the World Health Organization, 2003. 81: p. 609-615.]

to watch for suicidal signs and behaviors, improve their access to healthcare services, and limit access to ways of committing suicide. The government needs to ensure responsible media reporting, raise adolescents' awareness of mental health and improve their understanding of drug abuse-related diseases and suicides. At the community level, attention should be focused on providing interventions for the vulnerable groups at high risk of committing suicide, training caregivers, and setting up crisis intervention hotlines to provide necessary community support. At the family level, parents need to establish a positive and stable emotional connection with their children, help them boost their self-esteem and enhance their social skills. We should educate parents on how to respect young people's individuality and avoid invasive, manipulative, and excessive controlling behaviors, and encourage parents to adopt attitudes and behaviors that are beneficial to young people's health[29].

- **A sound healthcare system is needed to combat the youth mental health challenge**

According to statistics, there are two billion young people in the world, nearly 90% of which live in low- or middle-income countries. Half of mental problems start at the age of 14, but most cases remain undetected and untreated[30]. The negative effect of unresolved mental disorders is likely to extend to people's adulthood, undermining their physical and mental health and destroying their adult life. Unfortunately, the current healthcare systems are failing people in many ways: a) in terms of treatment, there is a huge gap between supply and demand; b) the number of mental health workers is significantly low, especially in low- and middle-income countries;and c) few civil society organizations exist in this regard and private efforts for mental health are rare.

To address the above-mentioned challenges, the World Health Organization has issued the Comprehensive Mental Health Action Plan 2013-2020. It outlines four research directions: to strengthen effective leadership and governance for mental health; provide comprehensive, integrated and responsive mental health and social care services in community-based settings; implement strategies for promotion and prevention in mental health; and strengthen information systems, evidence and research for mental health. The action plan specifically states that by 2020, 80% of the countries will have formulated or updated their mental health policies/plans in accordance with international and regional human rights instruments; 50% of the countries will have introduced or updated their mental health laws in accordance with international and regional human rights instruments; services covering severe mental disorders will have increased by 20%; 80% of the countries will have at least two national multi-sectoral mental health promotion and prevention programs in operation; the suicide rate in each country will be reduced by 10%; and 80% of the countries will collect and report at least one core set of mental health indicators every two years through their national public health and social information systems. These goals provide clear guidelines for countries to strengthen their healthcare systems and intensify their mental health efforts.

29: [Global Accelerated Action for the Health of Adolescents (AA-HA!): guidance to support country implementation. Geneva: World Health Organization; 2017. Licence: CC BY-NC-SA 3.0 IGO.]

30: [Kessler RC, Angermeyer M, Anthony JC, et al. Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's WorldMental Health Survey Initiative. World Psychiatry 2007; 6: 168–76.]

The Health Forum for Youth calls for global action to tackle youth mental health issues

Young people play a vital role in every society, family and country, and in the world. They serve as a bridge between the present and the future. When young people are afflicted by mental disorders, the bridge will fall down. As the first high-level platform in China's health field, the Global Health Forum of Boao Forum for Asia has been contributing to the early achievement of the United Nations Sustainable Development Goals. At the Health Forum for Youth, a group of youth organization representatives called for action to promote the health of young people, especially their mental well-being. The Health Forum for Youth has provided a good platform for people in Asia and other parts of the world to address youth health, in particular, youth mental health. All the countries in the world must pay attention to the youth health challenges and take collective action to tackle them. We hope that the ideas conveyed by the Health Forum for Youth can be universally recognized and then translated into practical actions. The Health Forum for Youth is a platform to speak for young people's health and contribute to the future of global health.

Annex

Annex1: List of Opening Ceremony and Plenary

■ **Opening Ceremony**

-Welcome speech by Mr. LI Baodong, Secretary General of Boao Forum for Asia

-Congratulatory letter of President Xi Jinping read by Vice-Premier Sun Chunlan

-Keynote Speech by Vice-Premier Sun Chunlan

-Remarks by Dr. Margaret CHAN , The Emeritus Director-General of World Health Organization, President of Global Health Forum of BFA

-Remarks by Mr. LIU Jiayi, Party Secretary of CPC Shandong Provincial Committee

-Remarks by Mr. Yasuo FUKUDA, Former Prime Minister of Japan, Chairman of Council of Advisors of BFA

-Video Speech by Dr. Tedros Adhanom GHEBREYESUS, Director-General of the World Health Organization

-Remarks by Mr. Elhadj As SY, Secretary General of the International Federation of Red Cross and Red Crescent Societies

■ **Plenary**

- Moderator: Prof. Gabriel Matthew LEUNG, Dean of Li Ka Shing Faculty of Medicine, the University of Hong Kong
- Keynote Speech: Academician CHEN Zhu,Vice-Chairman of the Standing Committee of the National People's Congress of China
- Speakers:

-Speech by Dame Jenny SHIPLEY, Former Prime Minister of New Zealand

-Speech by Mr. ZHANG Mao, Former Director of State Administration for Market Regulation of China

-Speech by Dr. HAN Seung-soo, Former Prime Minister of the Republic of Korea

-Speech by Mr. SHEN Xiaoming, Governor of Hainan Province of China

-Speech by Dr. MAM Bunheng, Health Minister of the Kingdom of Cambodia

-Speech by Mr. GAN Kim Yong, Minister for Health of the Republic of Singapore

-Speech by Mr. Seth BERKLEY, CEO of the Global Alliance for Vaccines and Immunization

-Speech by Dr. Zsuzsanna JAKAB, Deputy Director-General of World Health Organization

-Speech by Mr. PENG Huagang, Secretary General of the State-owned Assets Supervision and Administration Commission of the State Council

-Speech by Prof. Dame Sally DAVIS, Chief Medical Officer for England and Chief Medical Advisor to the UK

government

-Speech by Mr. HU Jinglin, Head of the National Healthcare Security Administration

-Speech by Ms. WANG Binying, Deputy Director General of the World Intellectual Property Organization

-Speech by LIU Depei, Former Vice President of Chinese Academy of Engineering

-Speech by Dr. Chris ELIAS, President of the Global Development Division, Bill & Melinda Gates Foundation

-Speech by Mr. YU Wenming, Head of the National Administration of Traditional Chinese Medicine of China

-Speech by Ms. JIAO Hong, Commissioner of the National Medical Products Administration of China

-Speech by Ms. ZHANG Haidi, Chairperson of the China Disabled Persons' Federation

-Speech by Mr. WANG Haijing, Vice Chairman of Red Cross Society of China

-Speech by Mr. WANG Qingxian, Member of the Standing Committee of the CPC Shandong Committee, Secretary of the CPC Qingdao Committee

-Speech by ZHANG Ruimin, Group Chairman of the Board of Directors and CEO of Haier

-Speech by arks by ZHANG Jianqiu, CEO of Inner Mongolia Yili Industrial Group Co., LTD.

-Speech by Susan SILBERMANN, Global President for Emerging Markets in Pfizer's Biopharmaceuticals Group

Annex2: List of Dialogue between Ministers and Enterprisers

■ **Theme:The Urgency of Chronic Non-communicable Diseases**

- Moderator: Dr. Anarfi ASAMOA-BAAH, Former Deputy Director-General of the World Health Organization
- Ministerial panelists:

  -Margaret CHAN, President of the Global Health Forum of Boao Forum for Asia

  -Elhadj As SY, Secretary General of the International Federation of the Red Cross and Red Crescent Societies

  -Seth BERKLEY, CEO of GAVI Alliance

  -GAN Kim Yong, Minister of Health of Singapore

  -Saphonn VONTHANAK, President of University of Health Sciences of Cambodia

  -Takeshi KASAI, Director of the Western Pacific Region of the World Health Organization:

  -Dame Sally DAVIES, Chief Medical Officer (CMO) for England and Chief Medical Advisor to the UK government

  -CUI Li, Former Deputy Director of the National Health Commission

  -ZHANG Mao, Former Director of the State Administration for Market Regulation

  -LUAN Xin, Vice Mayor of The people's Government of Qingdao

  -CHAN Hon Yee, Constance, Director of the Department of Health, HKSAR Government
- Panelists from companies:

  -LI Yinuo, Director of China Office of Bill & Melinda Gates Foundation

  -Susan SILBERMANN, Global President of Emerging Markets at Pfizer

  -WU Liuxin, Dean, Zhongguancun Xinzhiyuan Health Management Research Institute

  -CHEN Qiyu, Chairman and Executive Director of Shanghai Fosun Pharmaceutical (Group) Co., Ltd

  -DING Sheng, Dean, School of Pharmaceutical Sciences, Tsinghua University; Institute Director of the Global Health Drug Discovery Institute

  -WANG Jian, Chairman of BGI Group

  -YU Ruisheng, Chairman of Qingdao Ruiyuan Group

  -WANG Xiaoye, Market Access & Public Policy VP of MSD China

  -ZHANG Ligang, Chairman and CEO of ikang Healthcare Group

  -LI Zhe, Board chairman of Riverside Group

  -YU Qingming, Secretary of CPC committee of Sinopharm Group Co., Ltd.and Chairman of China Medical Devices Co., Ltd.

Annex3: List of moderators, speakers and panelists

■ **Session One: Innovation – The Future of Internet of Online healthcare (I)**

- With the continuous iterative development of the mobile Internet, especially the arrival of the 5G, the application of the Internet and other information technologies expand the space and content of medical services and the building of the online and offline integrated medical service models could cover pre- to post-diagnosis. Significant structural changes will occur in medical services. Use Internet Plus in the medical field with the innovate technology, promote the medical resources connectivity will strengthen the physician collaboration network (PCN), promote the in-depth integration of medical resources, and empower medical doctors around the world.
- Moderator:
  Wei ZHANG, Professor of West China School of Medicine / West China Hospital, Sichuan University
- Speech:
  Baodong LI, General Secretary, Boao Forum for Asia
  Qingguo XUE, Deputy Mayor, Qingdao City, P.R.China
- Panelists:
  -Defu ZHENG, Remote Consultation Center of Shangrao People's Hospital, Jiangxi Province
  -Hongkun HAN, Chairman of DSG Data Co., Ltd
  -Jie ZHAO, Chairman of Remote Medical Informatization Special Committee, Chinese Health Information Association
  -Maoyi TIAN, Senior Research Fellow at The George Institute, China and Conjoint senior Lecture of UNSW Sydney
  -Qingjun LU, Director of the Office of Telemedicine Management and Training Center, National Health Commission
  -Yuping YUAN, Co-founder of Doctor Union Tech Co., Ltd
  -Zhanxiang SHI, China General Representative of the Global Doctors Organization, Program Director of NIH Clinical Research Center in China
  -Zhong DAI, General Manager of China Mobile Group's Government-Enterprise Customer Branch

■ **Session Two: Innovative–Technology, Industrialization and Global Market**

- The 21st century is the century of life sciences. The emergence and application of innovative technology explosions has brought the products and solutions in the life sciences. Cell immunotherapy, proteomics research, 3D printing, continuous manufacturing and the application of artificial intelligence have greatly promoted the development of the life science industry. This session will discuss the development of innovative technology and industrial transformation in life science. This session will discuss the development of the innovative technologies and industrial transformation in the field of life sciences, with a view to enlightening and benefiting the application of related technologies.
- Moderator:
  Peter E. LOBIE, Fellow (Academician) of the Royal Society of New Zealand; Co-Director of the Precision Medicine and Healthcare Research Center in the Tsinghua-Berkeley Shenzhen Institute to its scientific advisory

board (SAB)

- Panelists:

-Alfredo BRUNO, PhD, Founder of AOT

-Bernd ALTPETER, Founder of DITG, Germany

-Lin XU, Founder and CEO of VIVA Nutrition

-Masatoshi MAKUUCHI, Director, Red Cross Hospital, Japan.

-Suzhen DONG, Chairman of Qingdao Haizete Biotechnology Co., Ltd

-Sylvia KANG, Co-founder and CEO of Mira

■ **Session Three – Innovative Technology, Industrialization and Global Market**

- In an era of health innovations, industrialization worked as an important step to fully realize their market potential and to better human lives. Technology, investment, and above all, laws and regulations are all essential prerequisites for industrial manufacturing of the innovations both regionally and internationally.

Moderator:

- Xiuyan LI, Founder of PharmaSynergy USA

Panelists:

- -Bernd HARTMANN, Head of the Burn Center with Plastic Surgery, Trauma Center Berlin, Germany

-Jianxin DUAN, Founder of Aihenghao Pharmaceutical

-Franz SCHUBERT, Founder, QRKSIN GmbH

-Guangsheng WANG, Vice GM of Qingdao Haier BioMedical

-Gerald J. YAKATAN, Founder and Chairman of Irisys Inc;

-Lars-Peter KAMOLZ, Professor, Medical University Graz, Austria;

-Xiaoshu LIU, Chief Economic Officer of Qingdao Bank

-Jianqiu ZHANG, Executive President, Yili Group

■ **Session Four: Innovation – The Future of Internet of Online healthcare (II)**

- With the continuous iterative development of the mobile Internet, especially the arrival of the 5G, the application of the Internet and other information technologies expand the space and content of medical services and the building of the online and offline integrated medical service models could cover pre- to post-diagnosis. Significant structural changes will occur in medical services. Use Internet Plus in the medical field with the innovate technology, promote the medical resources connectivity will strengthen the physician collaboration network (PCN), promote the in-depth integration of medical resources, and empower medical doctors around the world.

- Moderator:

Wei ZHANG, Professor of West China School of Medicine/West China Hospital, Sichuan University

- Panelists:

-Defu ZHENG, Remote Consultation Center of Shangrao People's Hospital, Jiangxi Province

-Hongkun HAN, Chairman of DSG Data Co., Ltd

-Jie ZHAO, Chairman of Remote Medical Informatization Special Committee, Chinese Health Information Association

-Maoyi TIAN, Senior Research Fellow at The George Institute, China and Conjoint senior Lecture of UNSW

Sydney

-Qingjun LU, Director of the Office of Telemedicine Management and Training Center, National Health Commission

-Yuping YUAN, Co-founder of Doctor Union Tech Co., Ltd

-Zhanxiang SHI, China General Representative of the Global Doctors Organization, Program Director of NIH Clinical Research Center in China

-Zhong DAI, General Manager of China Mobile Group's Government-Enterprise Customer Branch

■ **Session Five: Innovation – Medical Innovation and Development in the era of intelligence**

- Intelligent Medicine is becoming a new growth driver for the implementation of Healthy China strategy. As China comprehensively promote the health reform, various groundbreaking technologies emerge one after another, such as Artificial Intelligence, Internet of Things, Augmented Reality, Big Data, Tele-medicine, Precision Medicine, etc. thus bringing about huge transformation and progress. But at the same time, paramount issues still exist including the global health care system, uneven distribution of medical resources, high cost, low access and coverage of medical care. Smart cities need to be built to adapt to a new era and new technologies, artificial intelligence, Internet of Things, and sensing technology need to be adopted. International experts and talents are required to deliver better quality control and treatment paradigm and a brand new model should be established to benefit all people. A symbiotic and win-win industrial ecosystem becomes the only way forward in the context of China's new health reform. The session invites leaders from the industries, governments, research organizations and investors to share wisdom, build consensus, and bring international leading health service models to China. In alignment with local demands and resources, it is expected that health services will be provided to all people in a more scientific manner.
- Moderator**:**

  Dongping MENG, Vice President, China Chamber of Commerce for Import & Export of Medicines & Health Products (CCCMHPIE),
- Panelists**:**

  -Chunxue BAI, Professor, Ph. D Advisor, Zhongshan Hospital Affiliated to Fudan University, Director of Shanghai Respiratory Disease Research Institute

  -David Joszef Tapolczay, Ex LifeArc CEO

  -Jian WEI, Vice General Manager of Sinopharm Dongfeng Medical and Healthcare Co. Ltd., Dean of the Sinopharm Dongfeng General Hospital

  -Ligang ZHANG, Founder, Chairman and CEO of iKang Group

  -Pengsong JI, Chairman of Anhan Technology

  -Tao DAI, Deputy director of the Medical and Health Science and Technology Development Research Center of the National Health Council

■ **Session Six: Health in All Policies – Health Forum for Youth**

- A healthy generation of youth today holds the promise of a healthy world tomorrow. That simple dynamic is what inspires our common vision to promote youth health. Youth participation is the backbone of global health—a healthy younger generation will definitely be better able to make a contribution to a healthier

world today and tomorrow. Young people should be encouraged to actively participate in all dimensions and areas of global health. This session will pay attention to the health issues of young people, advocate for their participation in the resolution of global health issues, shed light on the development and promotion of global health, and call on older generations to work with the younger generation to explore, promote and participate in youth health issues globally.

- Moderator:
  James CHAU, WHO Goodwill Ambassador for SDG and Health
- Speech:
  Margaret CHAN, President of Global Health Forum of Boao Forum for Asia
  Longde WANG, Academician, Chinese Academy of Engineering
- Panelists:
  -Babatunde AHONSI, UNFPA Representative in China
  -Fabio SCANO, Coordinator, Disease Control at WHO Country Office China
  -Feng GUAN, Deputy Director of Neurosurgery Department, Beijing Shijitan Hospital affiliated to Capital Medical University
  -Glory SEFU, Former president of Medical Students' Association-Malawi
  -Hui YIN, Assistant Professor at Department of Global Health, Peking University
  -Jieli XIE, Chairman of ZALEM Co., Ltd.
  -Longde WANG, Former Vice-Minister of Ministry of Health, Academician of Chinese Academy of Engineering
  -Vivian TAN, Deputy Representative of UNHCR China
  -Zheng XIE, Associate Professor, Deputy Director of Dept. Global Health, Peking University

■ **Session Seven: Health in All Policies –The Development of the Medical Talents and Healthy China Strategy**

- This session aims to clarify the demand for medical talents in Healthy China strategy, analyze the development trend of continuing education of medical talents, and discuss the training mode of general practitioners and the all-round talent construction of medical management talents. It is also to communicate the needs of the health service industry and the future development direction of clinics in the context of the new medical policy, explore the role of the Internet in the development of the medical industry and to exchange reproductive health management and maternal health management to promote health China policy.
- Moderator:
  Bo HU, Director of Health and Medical Insurance Section, China Physician Association
  Speech
  Songlin LI, General Secretary, China Physician Association
  Xiaoqin LUO, Deputy Director of Global Health Forum (GHF)
- Panelists:
  -Caihong ZHANG, Vice Director, Science and Education Dept, National Health
  -Commission of China
  -Jinlong MA, Vice-Chair of Medical Genetics and Eugenics Association, Vice President of Women and Children Health Care Association, etc.

-Junhua ZHANG, Vice Director, Talents Exchange Center, National Health
-Commission of China
-Lingyu CHEN, President of Dr. Han Medical Group
-Xueping DU, Director of General Practitioner of China Physician Association
-Xiaohong HAN, Chairman of Dr. Han Medical Group

■ **Session Eight: Innovation – Innovation Dialogue between China and EU in the Field of Life Sciences**

- Europe is a concentrated area of the global biomedical industry. Since 1990s, a number of excellent biomedical industrial parks have emerged in China with the innovation and internationalization. This session will focus on the dialogue on the innovation in life sciences, exchanges between Chinese and European scientists and entrepreneurs. The dialogue could not only complement each other in experience, but also promote further cooperation.
- Moderator:
  Ahmed BOUZIDI, President of European Biopharmaceutical Enterprises (EBE)
- Panelists:
  -Martin REIMER, Executive Director of Medical Valley, Germany
  -Pierre VOGEL, Honorary Professor, Swiss Institute of Technology, Lausanne (EPFL)
  -Ronghui GAO, CEO of G-Med, UK
  -Xin LIU, Executive Director, BGI Qingdao
  -Yaowen WU, Young Academician, Royal Swedish Academy of Sciences
  -Zhanyou YUN, Chinese member of the expert committee IDF, R&D head of Yili Group
  -Zheming WANG, Founder of BSAZ Biotech Co., Ltd.

■ **Session Nine: Universal Health Coverage – Health Forum for Women**

- In many countries, women play a key role in the families, in societies and in the delivery of UHC as care providers, health professionals, community workers, etc., but they don't always get the recognition and the benefits. What are the main obstacles? What can women leadership in various domains do to raise awareness?
- Moderator:
  Margaret CHAN, President of Global Health Forum
- Panelists:
  -Bo WANG, Secretary General, Board Member of Shanghai Medical Innovation & Development Foundation
  -Dame Jennifer SHIPLEY, Former Prime Minister of New Zealand
  -Gwendolyn PANG Head of East Asia, International Federation of Red Cross and Red Crescent Societies
  -Ilona KICKBUSCH, Director of the Global Health Centre at the Graduate Institute of International and Development Studies in Geneva
  -Paige SNIDER, Senior Advisor of External Relations and Communications at WHO in China
  -Sally SMITH, Former Adviser for Faith Based Organizations in the Community Mobilization division, UNAIDS
  -Vivian LIN, Executive Associate Dean at Li KaShing Faculty of Medicine, The University of Hong Kong

■ **Session Ten: Innovation – The Opportunities and Challenges in the Global Medical Innovation**

Projects in China

- The global medical and healthcare market is undergoing profound adjustment and changes. Transforming and upgrading through innovation is the necessary way to breakthrough in the future. This forum will bring together industry leaders. The discussion will cover the policy, industry, capital and other aspects to provide support for the transformation the overseas medical innovation projects domestically.
- Moderator:
  Dongping MENG, Vice President, China Chamber of Commerce for Import & Export of Medicines & Health Products (CCCMHPIE)
- Panelists:
  -David Joszef TAPOLCZAY, Ex LifeArc(UK) CEO
  -Jun REN, CEO, New Summit Group
  -Ronghui GAO, M.D. MBA, Managing Director of G-Med Consulting
  -Weiming HAN Vice General Manager of CMDC Wuhan Company
  -Xiaokun LI, President of Wenzhou Medical University
  -Yifu XU, Vice President of CCCMHPIE, Vice President of Hengrui Group, Jiangsu

■ **Session Eleven: Innovation – International Colloquium of Microbiomes**

- The impact of microbiomes on human health has now been demonstrated world widely, particularly when underlying disease is present. From resistance to infection, to our response to chronic diseases such as cancer, autoimmunity and allergy, to effects on metabolism and neurological functions, microbiome is now recognized as a key player in virtually all aspects of human health. In this session, the experts, entrepreneurs and investors from China and the United States will discuss this topic and put the development of microbiology in the Asia-pacific, especially in China into practice.
- Moderator:
  Wenyuan SHI, Dean of Forsyth Institute, Harvard University
- Panelists**:**
  -Jeff F. MILLER, Microbiologist and Immunologist, Member of United States National Academy of Sciences
  -Jian XU, Researcher in Qingdao Institute of Biomass Energy and Bioprocess Technology of Chinese Academy of Sciences, Head of Single-cell Center
  -John MEKALANOS, Professor at Harvard Medical School, Member of United States National Academy of Sciences
  -Lin XU, Founder and CEO of VIVA Nutrition
  -Mark DAVIS, Vice President of Vice President of Brigham Health International
  -Weili ZHOU, Founder of AMPHORA Capital

■ **Session Twelve: Universal Health Coverage – Cooperation on the Global Public Health**

- Moderator:
  Xiaoping DONG, Director, Center for Global Public Health, CDC
- Speech :
  Fu GAO Director of CDC
  Yang ZHANG, Director, International Cooperation, National Health Commission of the PRC

Yong ZHANG, Vice Director, Disease Control Bureau, National Health Commission of the PRC

Chengyong QIN, Vice Director, Health Commission of the Shandong Province

Xin LUAN, Deputy Mayor, Qingdao City of Shandong Province

- Panelists:

-Angela Maree PRATT, Senior adviser, WHO Western Pacific Region

-Quentin SANDIFER, Executive Director of Public Health Agency, Wales

-Suwit WIBULPOLPRASERT, Global Health Advisor, Thai Ministry of Public Health, Vice Chair of International Health Policy Program Foundation (IHPF)

-Syed Muhammad Imran MAJEED, Vice President of National University of Sciences and Technology, Pakistan

-Tieru HAN, Retired International Staff Member of National Health Commission; Former Deputy Director of WHO Western Pacific Region

-Thomas Takpau SAMBA, Deputy Chief Medical Officer, Ministry of Health, Sierra Leone

-Xiaonong ZHOU, Director, Researcher of Parasitic Diseases Prevention and Control Institute, CDC

-Yan GUO, Professor of Peking University Health Science Center

-Yiming SHAO, Chief Expert, Researcher of AIDS Prevention and Control Center, CDC

■ **Session Thirteen: Health in All Policies – Rebuilding Lives living with Disabilities (Rehabilitation University)**

- Rehabilitation is to rebuild lives. Creating a rehabilitation university is the key for actively responding to the aging population, improving the quality of life, and improving the level of national rehabilitation. It is an important way to train talents for rehabilitation, as well as and an important choice for promoting the integrative development of prevention, medical care and rehabilitation. There is the need to gather multi-party's wisdom and technical support for the high starting point; high-level construction and the international development of the Rehabilitation University. In this session, we will share the international advanced concepts of rehabilitation, scientific research results and talents' training experience. We will also share the ideas of building rehabilitation universities, explore the effective ways and models of the interdisciplinary involve in training rehabilitation talents, transformation of research achievements and promote industrial development.
- Moderator:

Kai CHENG, Vice Chairman of China Disabled Persons' Federation

- Panelists:

-Chetwyn CHAN, Professor, Associate Vice Chancellor of Hong Kong Polytechnic University

-Dongmei LI , Director of Education and Employment Department, China Disabled Persons' Federation

-Hitoshi MARUYAMA, Former Vice President of International University of Health and Welfare

-Jianjun LI, Director of Chinese Institute of Rehabilitation Sciences; Vice President of Chinese Rehabilitation Association

-Jian WANG, Founder and Chairman of BGI Group

-Limin LIAO, Deputy Director of China Rehabilitation Research Center

-Sheila PURVES, Senior Consultant of The Hong Kong Society for Rehabilitation

-Takamichi TANIGUCHI, Professor of International University of Health and Welfare, Director of Department of Occupational Therapy

-Yi GU, President of College of Traditional Chinese Medicine, Tianjin University of Traditional Chinese Medicine

-Yongping ZHENG, Professor, Director of Department of Biomedical Engineering, Hong Kong Polytechnic University

-Zhigang CUI, Deputy Chief Physician of China Rehabilitation Research Center

-Wei WANG, Haier Group (Qingdao) Financial Holding Co. Ltd

-Zhimin LIU, Director of Innovation and Development Department, School Planning and Construction Development Center, Ministry of Education

-Zongshuai SONG, General Manager of Ottobock (China)

■ **Session Fourteen: Universal Health Coverage – Capacity building for emergencies, emerging and endemic infections**

- Under the influence of globalization, the establishment and maintenance of a resilient health system is becoming increasingly important to the international community and to individual countries. Promoting capacity building for health emergencies, emerging and endemic infectious diseases (such as AIDS, tuberculosis, malaria, etc.) is essential to saving lives and reducing suffering in conflicts, epidemic outbreaks and disasters, and to achieving health for all.
- Moderator: Ailan LI, Regional Emergency Director, WHO Health Emergencies Program, Director, Division of Health Security and Emergencies, the WHO Western Pacific Regional Office
- Speech :

  Takeshi KASAI, WHO Regional Director for the Western Pacific

  Panelists

  -Erika PLACELLA, Deputy Head of the Global Health Program of the Swiss Agency for Development and Cooperation (SDC)

  -Manson FOK, Dean, Faculty Medicine, Macau University Science & Technology Chairman, Virtus Medical Group

  -Gwendolyn PANG, Head of East Asia, International Federation of Red Cross and Red Crescent Societies

  -Angela PRATT, Director, Regional Director's Office & Communications and External Relations, WHO Regional Office for the Western Pacific

  -Xiaoming YANG, Chairman of the Board, China National Biotec Group Company Limited (CNBG)

■ **Session Fifteen: Universal Health Coverage – Sustainable Financing, Medical Insurance System and Poverty Alleviation Approaches**

- Adequate and sustainable funding, medical insurance system and poverty- alleviation approaches are required for achieving universal health coverage. Reliance on governmental assistance alone is not sustainable. A new approach of comprehensive financing that integrates external support, domestic investments and innovative resources are more promising.
- Moderator:

  Vivian LIN, Executive Associate Dean at Li KaShing Faculty of Medicine, The University of Hong Kong
- Panelists:

  -Enis BARIS, Health, Nutrition, Population Practice Manager in Europe and Central Asia, World Bank

-Hiroki NAKATANI, Board Chair, Global Health Innovative Technology Fund (GHIT Fund)
-Jinfu CHEN, Deputy Commissioner, National Healthcare Security Administration
-Qingyue MENG, Dean, Peking University School of Public Health Executive Director, Peking University China Center for Health Development Studies
-Suwit WIBULPOLPRASERT, Vice Chair of International Health Policy Program Foundation (IHPF), Health Intervention and Technology Assessment Foundation (HITAF)
-Young Soo SHIN, Former WHO Regional Director for the Western Pacific

■ **Session Sixteen: Universal Health Coverage – Aging**

- The problem of population aging needs to be actively addressed. By sharing international successes and failures in retirement policies, pension systems, insurance systems, nursing and community elderly care systems we can together find the optimal solution to achieve healthy population aging.
- Moderator:
  John BEARD, Chief Advisor, European Institute of Innovation and Technology Health Consortium
- Panelists:
  -Angela Pei-Chen FAN, Associate Professor, Department of Psychiatry, School of Medicine, National Yang-Ming University
  -Depei LIU, Academician of Chinese Academy of Engineering, Co-chair, InterAcademy Partnership for Health
  -Kazumi NISHIKAWA, Director of the Healthcare Industries Division, Commerce and Service Industry Policy Group, Ministry of Economy, Trade and Industry (METI)
  -Kee Seng CHIA, Tenured Professor and Dean of the School of Public Health, National University of Singapore
  -Margaret CHAN, President of Global Health Forum of Boao Forum for Asia
  -Seung-Soo HAN, Former Prime Minister of South Korea, Director of Yuhan Consortium
  -Takao TODA, Vice President for Human Security and Global Health Japan International Cooperation Agency (JICA)
  -Yue LIU, Coordinator for Governance of Universal Health Coverage (UHC) and Sustainable Development Goals (SDGs) at the WHO for the Western Pacific Region

■ **Session Seventeen: Universal Health Coverage – Primary Health Care in the Era of Chronic Non-communicable Disease (NCDs)**

- In the era of chronic non-communicable diseases, primary health care aims to help people focus on disease prevention and health promotion through comprehensive preventative measures, disease screening and healthy lifestyles. By strengthening the capacities and infrastructure of primary care we can promote "Health for All".
- Moderator:
  Gauden GALEA, WHO Representative in China
- Panelists:
  -Anil KAPUR, Chairman of the board of directors at World Diabetes Foundation
  -Katie DAIN, Chief Executive Officer of the Non-communicable Diseases Alliance

-Kim Yong GAN, Minister of Health, Singapore

-Ran D. BALICER, Founding Director at the Clalit Research Institute, Israel

-Tom FRIEDEN, President and CEO at Resolve to Save Lives

-Trevor GUNN, Vice President of International Relations at Medtronic PLC

■ **Session Eighteen: Universal Health Coverage – Traditional Chinese Medicine**

- Traditional Chinese medicine and western medicine have worked together and have been integrated into China's health system. By discussing this topic, we promote the safe and effective use of traditional Chinese medicine, call on countries to take steps to integrate traditional Chinese medicine into national health systems and share opinions about regulation and researches regarding traditional Chinese medicine.
- Moderator:

  Xiaopin WANG, Director, Cooperation and Communication Division at National Administration of Traditional Chinese Medicine, PRC
- Panelists:

  -Candong LI, President, Fujian University of Traditional Chinese Medicine

  -Christoph GUTENBRUNNER, Director/Chief Physician, Department of Rehabilitation Medicine at Hannover Medical School (Medizinische Hochschule Hannover, MHH)

  -Han Seong NG, Head, Traditional and Complementary Medicine, Primary and Community Care Division, Ministry of Health, Singapore

  -Jianping LIU, Director, Centre for Evidence-Based Chinese Medicine at the Beijing University of Chinese Medicine

  -Luqi HUANG, President, China Academy of Chinese Medical Sciences

  -Qi ZHANG, Director of the WHO's Traditional, Complementary and Integrative Medicine Unit(TCI)

  -Sumalee CHAISUPARAKUL, President of Chandrakasem Rajabhat University

■ **Session Nineteen: Health in All Policies – Planetary Health**

- Many of the global health challenges that we face today are related to degradations in biodiversity and ecosystems. The ability to manage and respond to environmental and climate changes is especially important in the face of global health challenges. The world must pay attention to this issue by exploring comprehensive and effective policies to protect the health of the planet.
- Moderator:

  Vivian LIN, Executive Associate Dean at Li KaShing Faculty of Medicine, The University of Hong Kong
- Panelists:

  -Anthony CAPON, Inaugural Professor of Planetary Health in the School of Public Health at the University of Sydney Former director of the International Institute for Global Health at United Nations University

  -Gabriel M. LEUNG, Dean of Medicine, The University of Hong Kong, Inaugural Helen and Francis Zimmern Professor in Population Health

  -Ole DOERING, Adjunct Professor in Karlsruhe Institute of Technology; Co-Founder at the Institute of Global Health, Berlin

  -Peng GONG, Professor and Chair, Department of Earth System Science, Tsinghua University; Dean, School

of Sciences, Tsinghua University

-Suwit WIBULPOLPRASERT, Global Health Advisor, Thai Ministry of Public Health, Vice chair of International Health Policy Program Foundation (IHPF) and Health Intervention and Technology Assessment Foundation (HITAF)

■ **Session Twenty: Health in All Policies – Urban Development**

- Creating a healthy city means creating conditions for each resident to live a healthier, safer and more fulfilling life. This requires integrating this philosophy into all relevant policies and promoting a people-oriented urban design that will bring both environmental and health benefits.
- Moderator:

  Ilona KICKBUSCH, Director of the Global Health Centre at the Graduate Institute of International and Development Studies in Geneva.
- Panelists:

  -Ahmed Al-MANDHARI, WHO Regional Director for the Eastern Mediterranean

  -Dame Jennifer SHIPLEY, Former Prime Minister, New Zealand

  -Depei LIU, Academician of Chinese Academy of Engineering Co-chair, InterAcademy Partnership for Health

  -Xin LUAN, Vice Mayor of Qingdao, Shandong Province, China

  -Kee Seng CHIA, Tenured Professor and Founding Dean of the School of Public Health, National University of Singapore

  -Nicholas ROSELLINI, UN Resident Coordinator in China

  -Dame Jennifer SHIPLEY, Former Prime Minister of New Zealand

■ **Session Twenty-one: Universal Health Coverage – China-Japan Life Sciences and Health Care Industry Development Forum**

- With the acceleration of the aging process, the rigid demand for life care, medical services and rehabilitation care for the elderly is increasing. According to the national social science fund "research on pension consumption and pension industrial development", by 2050, China will have 75 million people over 80 years old, the number of incapacitated elderlies will reach 120 million. The rigid needs of medical care, nursing services around the elderly will become the next "outlet". As an early aging country, Japan has successfully explored the integration of medical care and nursing. Drawing on the mature experience of Japan will give some inspiration to our country to develop our own supporting mode for elder people
- Moderator :

  Yale SU, GM of Zhongkang International Health Management

  Gang JIN, Member of the Council, Chinese Health Association; Vice GM of Zhongkang International Health Management

  Speech:

  Zhenhua SUN, Director, Qingdao Municipal Health Commission
- Panelists:

  -Bin QIN, Chief Physician of Department of Neurology, Beijing Hospital, Ministry of Health

  -Jianguo QU, Vice President of China Health Information and Medical Big Data Association, Chairman of

Shanghai Origincell Tech. Group

-Kazufuku NITTA, Member of the Board of MAGOS Co. Ltd

-Koichi TANAKA, Japanese Academician; President of Kobe International Medical Center

-Ruisheng YU, Chairman of Qingdao Ruiyuan Group

-Lijing YAN, Head of Non-communicable Chronic Diseases (NCDs) Research at the Global Health Research Center; Director of Graduate Studies for the Master of Science in Global Health Program at Duke Kunshan University in China\

-Weidong YU, Deputy Director, Institute of Molecular Biology, Peking University People's Hospital

-Xinhua LI, Deputy Director of Chinese Center For Disease Control And Prevention

-Yoshiko SUGII, Council Member and Trainer of the Japanese Society of Hematology

■ **Session Twenty-two: Innovation – South-South cooperation in healthcare industry**

- China has a long history in south-south cooperation in health starting with the Chinese medical teams. With increasing trade and human traffic flow between China and the global south, emergence of new technologies and ecosystem, what have we learnt from previous experiences and what should be our joint aspiration for south-south health cooperation in the future.
- Moderator:

  Alex NG, Deputy Director, China Country Office, Head of Health and Innovation, the Bill & Melinda Gates Foundation
- Panelists:

  -Can LI, General Manager, China Sinopharm International Corporation and Sinopharm Healthcare Corporation

  -Ming XU, Head, Department for Emerging Economies, External Relations Division, Global Fund

  -Yinuo LI, Director, China Country Office, Bill & Melinda Gates Foundation

  -Weijun CHEN, Head of Communicable Disease Group of BGI Group

■ **Session Twenty-three: Health in All Policies – NCD Risk Factors**

- Food, nutrition and physical activities are closely related to our daily lives. In addition to global food shortages and food safety issues, NCDs have arisen due to a surge in processed foods, urbanization and unhealthy life style. It is imperative to explore how we can integrate healthy policies to address NCD risk factors.
- Moderator:

  Katie DAIN, Chief Executive Officer of the NCD Alliance
- Panelists:

  -Constance CHAN, Director of Health, Department of Health of the Government of the Hong Kong Special Administrative Region

  -Ilona KICKBUSCH, Director of the Global Health Centre at the Graduate Institute of International and Development Studies in Geneva

  -Mike DAUBE, Emeritus Professor at Curtin University in Western Australia; Director of the Public Health Advocacy Institute

  -Sally CASSWELL, Co-Director, SHORE & Whariki Research Centre, at the College of Health, Massey University

-Yan GUO, Professor, Health Policy and Management, School of Public Health, Peking University Health Science Center

-Yaping DENG, Olympic champion, table tennis grand slam winner, CEO of Deng Yaping Sports Industry Investment Fund

-Kim SWEENY, Principal Research Fellow at VISES

■ **Session Twenty-four: Health in All Policies – Antimicrobial Resistance**

- Antimicrobial resistance is a very serious problem. Countries are exploring how to use policies to raise awareness and strengthen knowledge through monitoring and research. There are success stories in countries in reducing the incidence of infections, optimize the use of antimicrobials, and intervene by increasing investments in new drugs, diagnostic tools, vaccines and other prevention treatments.
- Moderator:
  Dame Sally DAVIES, Chief Medical Officer for England
- Panelists:
  -Junshi CHEN, Academician of Chinese Academy of Engineering, Research fellow at the China National Center for Food Safety Risk Assessment
  -Marc SPRENGER, Director, Antimicrobial Resistance Secretariat, WHO
  -Sheng DING, Dean, School of Pharmaceutical Sciences, Tsinghua University; Institute Director of the Global Health Drug Discovery Institute (GHDDI)
  -Stephanie S. CRISTIN, Health Innovation & Partnerships Advisor, International Committee of the Red Cross (ICRC)
  -Susan SILBERMANN, Global President for the Emerging Markets in Pfizer's Biopharmaceuticals Group
  -Zhijie ZHENG, Professor and Chair, Department of Global Health, Peking University School of Public Health
  -Jianping SHEN, Chairman of Zhejiang Huateng Animal Husbandry Co., Ltd

■ **Session Twenty-five: Innovation – Internet Age: Opportunities and Challenges**

- With advancements in technology and the increasing attention on health issues, more and more new technologies have been applied to the health industry. There is a need to systematically manage the adverse effects of technologies, paying special attention to ethical, legal and social impact.
- Moderator:
  Hani ESKANDAR, ICT Applications Coordinator, Telecommunication evelopment Bureau, International Telecommunication Union (ITU)
- Panelists:
  -Douglas BETTCHER, Senior Adviser to the Director-General of WHO
  -Emma BOYLAND, Experimental psychologist and senior lecturer, the University of Liverpool
  -Irene Dankwa-MULLAN, Deputy Chief Health Officer, IBM Watson Health, IBM Corporation
  -Ran D. BALICER, Founding Director at the Clalit Research Institute
  -Simao CAMPOS, Counsellor for ITU-T Study Group 16, ITU
  -Yanwu XU, Chief Architect/Scientist of AI Innovation Business Department, Baidu Inc.

■ **Session Twenty-six: Innovation – New Technology in Health Delivery**

- With increasing attention on new technologies like artificial intelligence (AI), cancer treatment and vaccine development, it is important to explore the contribution of these technologies to improving the health and well-being of the population in achieving the Sustainable Development Goals.
- Moderator:
  Ian SMITH, Former Executive Director, Office of the Director-General, WHO
- Panelists:
  -Binying WANG, Deputy Director General, Brands and Designs Sector, World Intellectual Property Organization
  -Bo WANG, Secretary General, Board Member of Shanghai Medical Innovation & Development Foundation
  -Detlev GANTEN, President, World Health Summit
  -Koichi TANAKA, Japanese Academician; Former President, Kyoto University Affiliated Hospital

■ **Session Twenty-seven: Innovation – Leap frogging technology for health: Malaria Case Study**

- In contrast to developed countries, developing countries are still in need of innovative medical solutions that are low-cost and easy to implement. There is a need to address power shortages, inconvenient transportation, and uneven distribution of medical resources. Exploring international cooperation is conducive to improving global health.
- Moderator:
  Pedro ALONSO, Director of the WHO Global Malaria Program
- Panelists:
  -Abdourahmane DIALLO, CEO at Roll Back Malaria (RBM) Partnership to End Malaria
  -Christopher PLOWE, Director, Duke Global Health Institute
  -Hiroki NAKATANI, Board Chair, Global Health Innovative Technology Fund (GHIT Fund)
  -Minghui REN, Assistant Director-General, Universal Health Coverage/ Communicable and Noncommunicable Diseases
  -Ming XU, Head of the Department for Emerging Economies in the Global Fund
  -Philip WELKHOFF, Director of the Malaria Program at the Bill & Melinda Gates Foundation
  -Qiyu CHEN, Chairman and Executive Director of Shanghai Fosun Pharmaceutical (Group) Co., Ltd

■ **Session Twenty-eight: Innovation – Reinvented Toilet**

- The Bill & Melinda Gates Foundation's "Next-Generation Toilets" program seeks to solve the problems caused by the deficiencies of public toilets. The sufficient public toilets will allow all people to live more healthy and dignified lives. The goal is to inspire people to work together in finding innovative solutions that can be applied around the world.
- Moderator:
  Wei TIAN, National Mental Health Ambassador, Hostess of CCTV
- Panelists:
  -Attawut KUMKRONG, Reinvented Toilet Business Head, SCG Chemicals Co., Ltd., Thailand
  -Jayant Narsee BHAGWAN, Executive Manager for Water Use and Waste Management at the South African Water Research Commission WRC
  -Mouhamadou GUEYE, Director, Program for the Structuring of the Fecal Sludge Market in Senegal (PSMBV)

-Qinglei SUN, Head of Urban Sanitation Dept. of Qingdao City Administration Bureau

-Sally SMITH, Former Adviser for Faith Based Organizations in the Community Mobilization division, UNAIDS

-Yinuo LI, Director, China Country Office, Bill & Melinda Gates Foundation

Annex 4: Qingdao Declaration on Global Youth Health

In this new era, young people are standing at the forefront of global health and propelling its future development. We acknowledge that health is a right and not a privilege. As a representative group of young people from diverse national, cultural, religious, and social backgrounds, who have gathered at the Youth Forum of the First Global Health Forum of Boao Forum for Asia, we are united in our efforts and voices. We call on other young people around the world to contribute to and join our capacities, wisdom, and vibrant energy, regardless of national boundaries, to shoulder the responsibility of global health development and strive for a healthy and sustainable world. Together, we declare the following:

1. We fully affirm the "We the future" – A Youth Declaration, which was presented at the 67thUnited Nations DPI NGO Conference, and we aim to share its values and visions, abide by its commitments, and achieve its health targets, including (but not limited to) achieving the targets that were set forth in the United Nations 2030Agenda for Sustainable Development;

2. We recognize that young people of different religious beliefs and cultural backgrounds throughout the world should respect each other, be inclusive and understanding of each other, and take the initiative to shoulder responsibility for global health development;

3. We appreciate the "Health Beyond Health" concept, not only for its pursuit of individual physical health but also for its inclusion of mental, psychological, physical, social, environmental and moral health, together with other aspects of well-being;

4. We call for strengthening young people's health literacy, increasing their control of their own health, empowering themselves, and enabling their engagement in global health actions;

5. We acknowledge the impact that nurturing new generations can have on sustainable societal and urge young people around the world to acquire knowledge of maternal well-being, newborn care, and the risks of maternal and newborn mortality in order to achieve sustainable development;

6. We draw special attention to the importance of HIV/AIDS control and encourage young people to stay faithful to their partners and use condoms consistently;

7. We are fully aware of the negative effects of smoking and alcohol consumption on personal health, on others, and on society and emphasize the benefits of a healthy diet and regular physical activity, while recognizing that a positive mental health is the foundation of efficient work and happiness;

8. We highlight the potential for ourselves—young people—to advocate for and promote future global health, to call on other young people to engage in health-related scientific research, as well as practical work, in order to develop our leadership skills and prepare for future global health governance.

Annex 5: Media

■ **Summary of opening press conference, 16:00 -16:30, 10 June**

The press conference was chaired by Mr. Xue Qingguo, Vice Mayor of Qingdao. Dr. Margaret Chan , President of the Global Health Forum, delivered opening remarks and welcomed experts, scholars, entrepreneurs and the media, explaining the purpose and theme of the Forum, introducing the main speakers and describing the various sessions, roadshows and the concurrent Global Health Expo.

Dr . Chan also acknowledged the support and participation of many UN and other international organizations, and Chinese state departments including the National Health Commission, State-owned Assets Supervision and Administration Commission of the State Council, State Administration of Market Regulation, National Healthcare Security Administration, Chinese Academy of Engineering, National Administration of Traditional Chinese Medicine, National Medical Products Administration, China Disabled Persons' Federation and the Red Cross Society of China.

In the following Q&A session, a journalist from CCTV Economic Channel asked what role the conference will play to promote people's physical and mental health. Dr Chan answered that the conference serves as a platform where countries, businesses and research institutes can share their experiences and stories. China also has to tell its stories well and to learn through such exchanges. This platform is designed to promote discussions and international cooperation.

China.org.cn asked how this conference is different from other recent domestic and international health conferences in terms of level, perspective, industry-research interaction and high-level dialogues and how this conference will promote domestic and international health development. Dr Chan responded that we need to keep an open mind and collaborate with people from other areas and to engage the industry, the academia and the research community for dialogues and cooperation. In the past, they worked on their own and might not have the platform for exchanges and interaction. That's why this conference is important as a platform for dialogues.

Qingdao Daily asked what this conference will bring to the comprehensive health industry of Qingdao. Vice Mayor Xue Qingguo answered that hosting this event will help to promote the opening up of Qingdao and Shandong and help Qingdao with its ongoing endeavor to promote investment and recruit professionals. China Daily asked about the features and highlights of the concurrent Global Health Expo. Vice Mayor Xue answered that its feature is innovation. As dozens of previous sessions of Boao Forum for Asia were all held in Hainan, this event is new in terms of its location and its special focus on health. Under the leadership of the Secretariat of Boao Forum for Asia and the direct guidance of Dr Margaret Chan, discussions have been held for 25 cooperation projects which will be established by the end of this year with a total contract value of 30 billion yuan, of which foreign investment is 260 million US dollars. Those projects mainly involve high-end medical services, biomedicine, medical equipment, rehabilitation, elderly care, TCM, etc. and will attract more companies, talents, capital and innovative technologies to Qingdao and promote the development of the health industry in Qingdao.

The opening press conference was covered in more than 100 reports.

Summary of closing press conference, 17:00-17:30, 12 June 2019

The press conference was chaired by Mr. Luo Xielong, Executive Director of the Organizing Committee of the Global Health Forum. Dr . Margaret Chan made a closing speech expressing her pleasure for the warm response and wide recognition of the theme "Health Beyond Health — In the Year of Sustainable Development 2030". She reviewed the 28 sessions held during the Forum, highlighting the contributions made by many experts from various countries, noting the value of dialogue and brainstorming where countries and institutions learned from each other based on equality and mutual respect.

Dr. Chan said that many national representatives, health ministers and representatives of international organizations shared their views on the Global Health Forum and called on the public health sector to do more for the people. No matter where the development of the health sector and health industry will go, they should share the same ultimate goal to serve all the people in the world.

In conclusion, Dr Chan announced that the date of second conference of the Global Health Forum of BFA and it will be held in Qingdao in 2020. She also expressed her sincere thanks to all the participants and staffs for their support.

The closing press conference was covered in more than 50 original reports.

Acknowledgement

We would like to thank all the individuals and institutions that have contributed to the development of this report on the first conference of the Global Health Forum of BFA , which is intended to facilitate the sharing of takeaways from the conference—including Mr. Li Baodong, BFA Secretary General, for his generous support; Dr. Margaret Chan, GHF President, for her inspiring guidance; Beijing Huaxia Hongli Healthtech Research Co., Ltd. and the Department of Global Health, Peking University School of Public Health for co-writing this report; the National Administration of Traditional Chinese Medicine for authoring the chapter on traditional medicine; and the East Asia Regional Office of the International Federation of the Red Cross and Red Crescent Societies (IFRC) for its great data support.

The BFA Secretariat is responsible for framework design, writing guidance and editing for the report. Given the limited amount of available literature and ability, the report may contain certain mistakes or omissions. Any critical comment or feedback is welcome.

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Health Beyond Health

—— In the Year of Sustainable Development 2030